

PRINTRONIX®

User's Manual



The Printronix L5020 Multifunction Printer

Consumables Information

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Consumable Item	Part Number	Replacement Interval (in Pages) ¹
Toner cartridge	703532-001	21,000
Waste toner bottle	202984-001	150,000
Photoreceptor drum	703535-001	150 - 300,000 See Note 2
Developer	703548-001	150,000
Developing Unit	705739-001	600,000
Note 1: Varies with paper size, media type, and toner coverage. Note 2: Inspect every 150,000 pages; clean if needed. Replace at 300,000 pages or sooner if print quality is no longer acceptable. Drum life is dependent upon media used and proper maintenance and operation of the printer. Print media other than bond paper (e.g., labels, card stock, plastic, or vinyl) may reduce drum life as much as 50%.		

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L5020 Multifunction Printer

User's Manual

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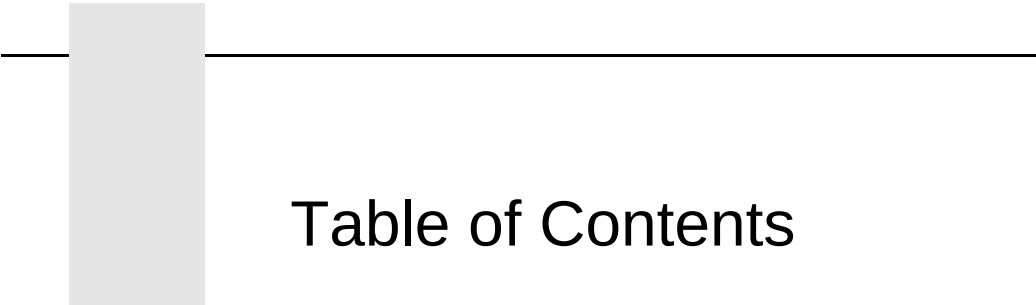


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1

Introduction

About This Manual

This manual explains how to use your printer.

Safety Notices And Special Information

For your safety and to protect valuable equipment, it is very important that you read and comply with all information highlighted under the following special headings:

WARNING A warning notice calls attention to a condition that could harm you.

WARNUNG

Ein Warhinweis dieser Art weist auf Verletzungsgefahr hin.

AVISO

Las notas de aviso llaman la atención sobre una condición que puede causar lesiones.

ATTENTION

Attire votre attention sur une opération pouvant présenter un danger.

AVVERTENZA

Un'indicazione di avvertenza segnala una condizione di pericolo suscettibile causare lesioni all'operatore.

CAUTION A caution notice calls attention to a condition that could damage the printer.

Chapter 1 Important Safety Precautions

IMPORTANT An important notice provides information that is vital to proper operation of the printer.

NOTE: A note provides information and helpful tips about printer operation.

Control Panel Keys And Display Messages

Keys and indicators that are labeled on the printer are printed in uppercase letters. For example:

Press ENTER to select the value shown on the LCD.

Messages that appear on the control panel message display (called the Liquid Crystal Display, or LCD), are printed in uppercase letters and enclosed in quotation marks. For example:

“ENTER SWITCH LOCKED” appears on the LCD.

Important Safety Precautions

Observe the following precautions at all times to ensure safe operation of the printer.

Read all instructions and save them for future use.

Follow all safety notices and instructions printed in this manual and marked on the printer.

The operator-accessible power switch does not shut off all power to the printer. You must unplug the power cord to shut off all power to the printer.

The power outlet must be near the equipment and easily accessible.

The printer relies on protective devices in the building installation for protection. The printer must be connected to a 30 Amp, 250 V outlet.

Do not operate the printer in a room that is not properly ventilated. The room should be at least 1,000 cubic feet with a complete air exchange every two hours.

Safety Notices And Special Information

Remove packaging materials carefully and save them for possible future use. If the printer is powered on without removing all internal tape and packing, the printer may be damaged.

Keep combustible materials away from the printer. Dispose of used toner properly, as it is flammable.

Keep away from components in the printer that are potentially hazardous. For example, the fuser unit becomes very hot under normal operating conditions, and several components use high voltage.

Handle the photoreceptor drum properly, due to the nature of the material. Do not put used drums in the trash; ship them to the appropriate disposal facility for recycling. (See page 122.)

Do not block or obstruct any cabinet ventilation slots.

Never spill liquid on or in the printer. Use only approved cleaning agents and methods.

Put nothing on the power cord. Do not locate the power cord where people can walk on it. Do not place the power cord under any carpet.

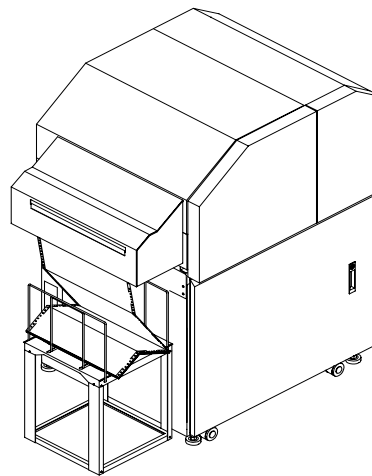
Do not lean on or put heavy objects on top of the printer.

Turn off the power immediately if the printer emits an unusual noise or smell.

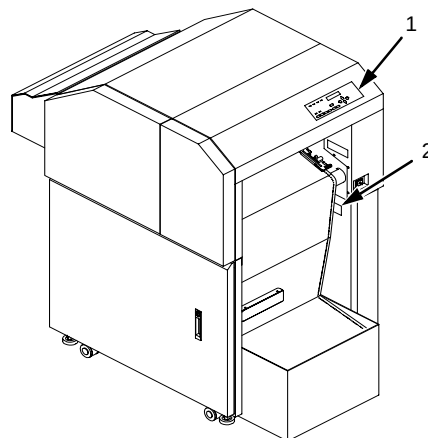
Do not look directly at the flash lamp light.

Components And Labels

Rear of Printer



Front of Printer



Legend:

- 1) Control Panel
- 2) CAUTION

Figure 1: Front and Rear Views

Safety Notices And Special Information

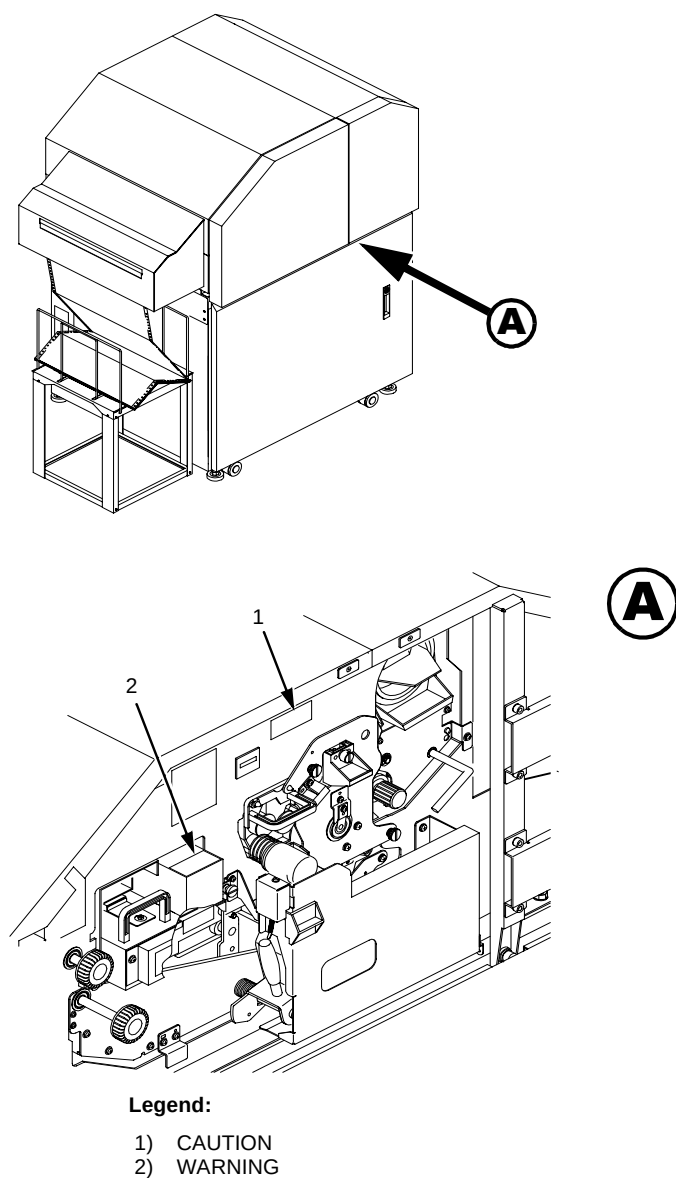
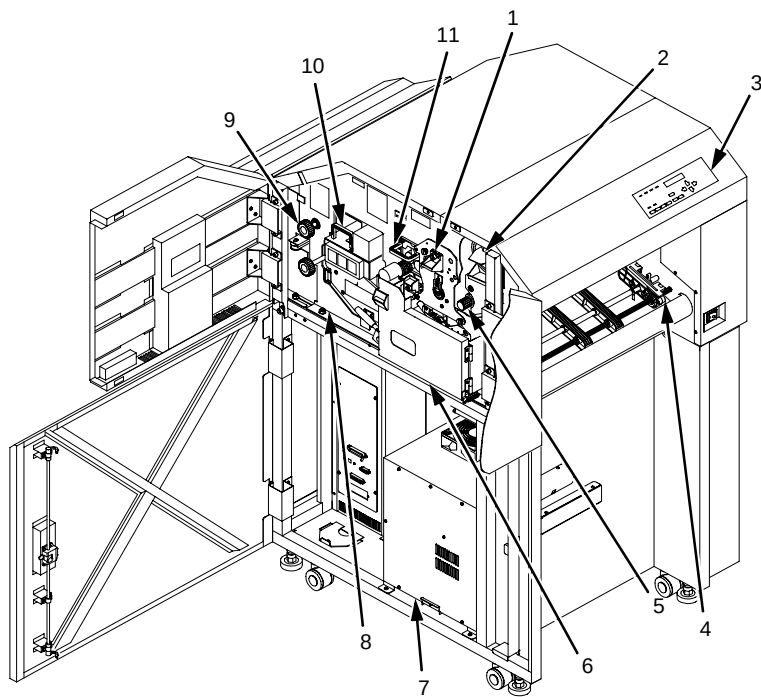


Figure 2: Safety Labels Behind Front Upper Doors

Chapter 1 Components And Labels

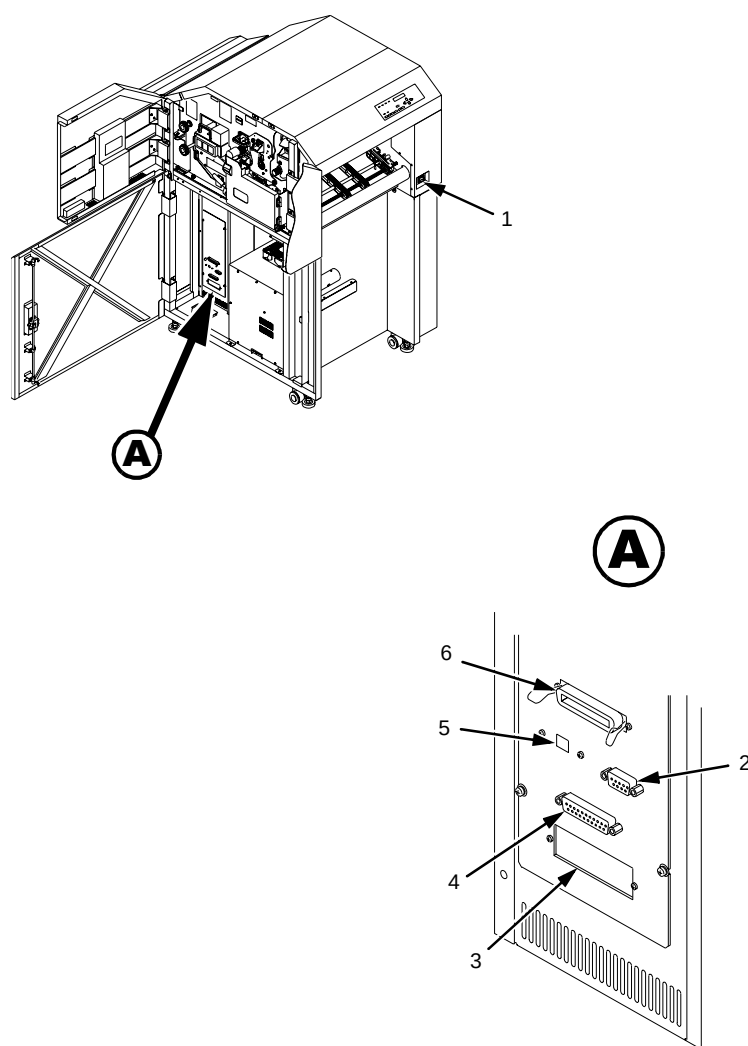


Legend:

- 1) Main Charger
- 2) Toner Cartridge
- 3) Control Panel
- 4) Paper Feed Tractor
- 5) Developing Unit
- 6) Waste Toner Recovery Unit
- 7) Flash Power Supply
- 8) Transport Unit
- 9) Scuff Roller
- 10) Fuser Unit
- 11) Cleaning Unit

Figure 3: Printer Components

Safety Notices And Special Information



Legend:

- 1) Power Switch
- 2) Diagnostic Port
- 3) Optional Coax/Twinax Port
- 4) Serial Port
- 5) 232/422 ToggleSwitch
- 6) Parallel Port

Figure 4: Power Switch and Printer Interfaces

About The Printer

Printing speed is 20 pages per minute on continuous letter size and A4 size fanfold forms (long edge fed). The printer produces printed output with a 300 x 300, (or optionally) 240 x 240, or 400 x 400 dots-per-inch (dpi) resolution. See Appendix B for printer specifications.

Features

Features include the following:

- Continuous fanfold paper
- User-replaceable toner cartridge
- FlashFusion™ fusing technology
- Two-line, 16-character alphanumeric display that provides operating and error messages
- Flash Memory which stores preset configurations and emulations
- Serial and parallel interfaces
- Coax/Twinax interface (optional)
- Power stacker (optional)

Emulations

Your printer comes equipped with the Printronix® LinePrinter Plus® emulation software (which emulates an impact printer). Printronix LinePrinter Plus includes the following printer protocols:

- P-Series
- P-Series XQ
- Serial Matrix
- Proprinter® III XL
- Epson® FX-1050

Fonts And Forms

Printronic LinePrinter Plus provides portrait and landscape image orientation. Automatic 1-up, 2-up, 4-up, and gray bar overprinting are also provided. The emulation also offers optional proportional (scalable) fonts.

The following optional emulations are also available:

- IGP[®]/PGL[®]
- IGP/VGL
- PCL5[®]
- IPDS[™]

For specific information on each emulation, see the appropriate emulation manual.

Fonts And Forms

The printer provides a variety of resident fonts. The emulation you are using determines what resident fonts are available. For example, the LinePrinter Plus emulation provides CG Times, Letter Gothic, Courier, OCR-A, and OCR-B as standard sets of fonts.

With either the LinePrinter Plus or PCL 5 emulations, you can load additional fonts into printer memory. Once any additional fonts are in printer memory, you can then access them in the same way as the resident fonts. Note that if you download fonts from the host computer and do not save them, the downloaded fonts are lost when the printer is powered off.

You can store forms together with fonts. The storage space for forms and fonts depends upon the amount of printer memory available. You can manipulate different fonts and/or forms depending upon the emulation installed.

Chapter 1 About The Printer

2

Initial Setup

Installation Overview

This chapter explains how to load paper, power on the printer, use the optional power stacker, and how to use the control panel.

The installation and setup of your printer should be performed by a service provider trained and authorized by Printronix. Your service provider is also responsible for doing a preinstallation site survey, unpacking the printer, connecting the power and host data cables, and installing the first set of consumable items in the printer.

Depending on the terms of your service contract, your service provider might also power on your printer and configure it.

As the owner of the printer, it is your responsibility to prepare the printer site. This includes providing adequate ventilation and power for the printer.

Loading Paper

Do the following steps whenever top-of-form must be reset (after clearing a paper jam, loading new paper, etc.).

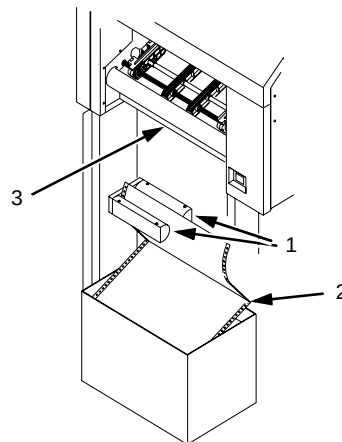
NOTE: You do not need to power off the printer power to replace paper. If you leave the printer on and replace the paper it will resume printing where it left off when you put it on line.

1. Place the paper box under the tractor unit with the first paper fold toward the printer.

IMPORTANT

Be sure the leading edge of the paper has a clean, separated perforation without ragged edges.

2. Pass the leading edge of the paper between the lower paper guides to prevent jams. Put the first fold of the paper facing the printer as shown.



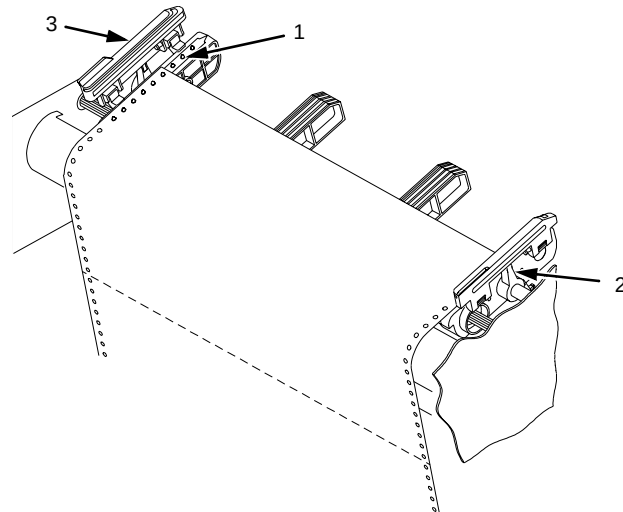
Legend:

- 1) Paper Guides
- 2) First paper fold is toward printer
- 3) Tractor Unit

3. Unlock only the right tractor by pushing forward on the tractor lock.
4. Open the left and right tractor gates and place the paper about half-way onto the tractor pins. Do not push the paper past the

tractors; a paper jam sensor will detect a paper jam if the paper is pushed too far.

5. Close the left tractor gate.



Legend:

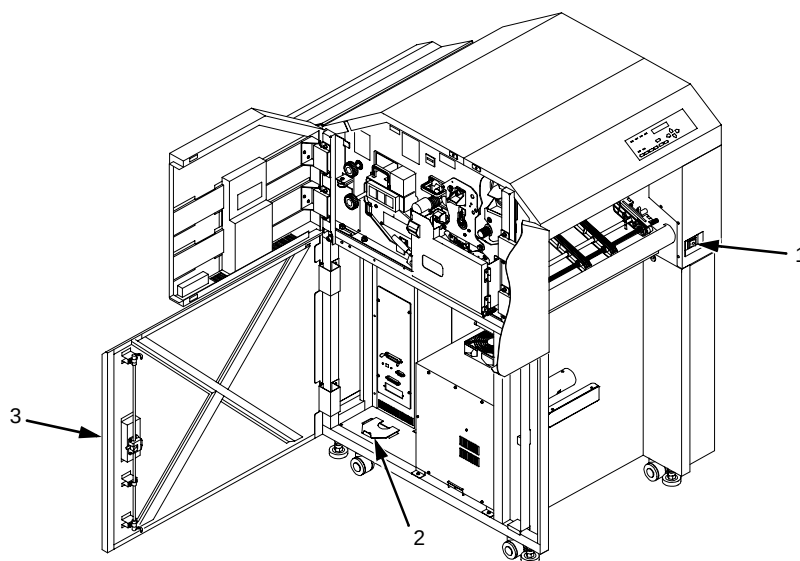
- 1) Tractor Pins
- 2) Tractor Lock
- 3) Tractor Gate

6. Move the right tractor until its pins line up with the holes in the right edge of the paper, put the paper on the pins, then close the right tractor gate.

Chapter 2 Loading Paper

7. Introduce a slight amount of side-to-side tension into the paper by setting the right tractor far enough to the right so that there is no looseness or wrinkles in the paper. Be careful not to set the right tractor too far to the right, however, as too much tension may cause the paper holes to tear away from the tractor pins.
8. Tighten the paper by moving the right tractor slightly outward and lock the right tractor with the tractor lock.
9. If you are reloading paper following a "PAPER EMPTY" message with the printer power on, press ONLINE to place the printer online. The printer automatically sets the physical top of form at the leading edge of the paper and resumes printing.

Powering On The Printer



Legend:

- 1) Power Switch
- 2) Strain Relief
- 3) Door Latch

Figure 5: Power Switch

CAUTION The printer must be connected to the proper power source: 220-240 VAC and 50-60 Hz, as shown on the rear panel label. Using an incorrect power source may damage the printer.

1. Open the cabinet door by turning the key and flipping up the latch.
2. Route all cables through the hole in the bottom of the cabinet and secure them with the strain relief.
3. Make sure the printer is plugged into the appropriate power source, the interface cables are connected, and the host computer is on.
4. Close the cabinet door and flip down the latch.

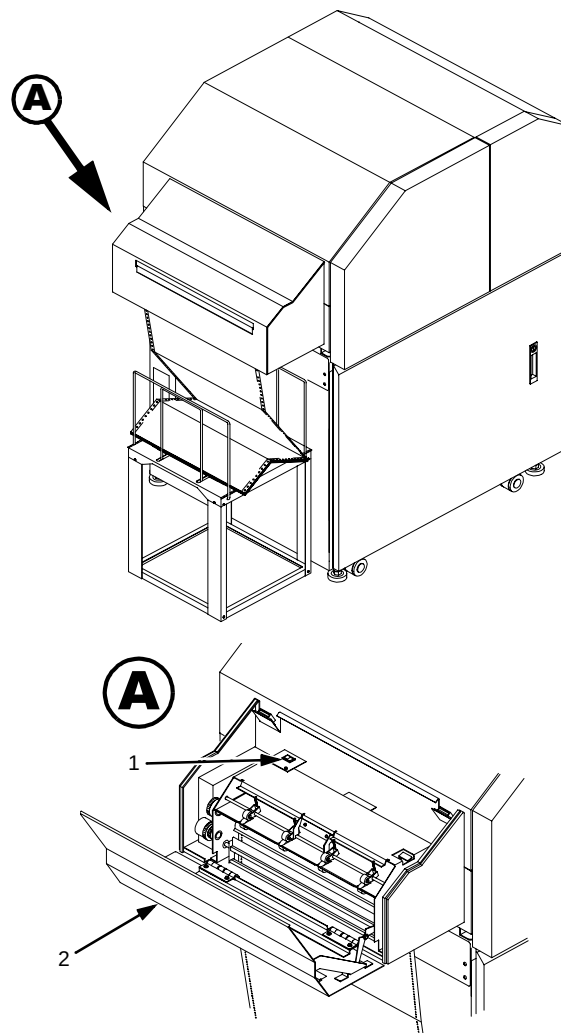
Chapter 2 Powering On The Printer

5. Turn on the printer by setting the power switch to | (on). When you power on the printer, the following occurs:
 - a. The printer reads the emulation boot file and displays the message:
H0: TEST HARDWARE
PLEASE WAIT...
 - b. The ONLINE indicator lights continuously and STAND BY goes out.

NOTE: The printer can be set to power on in the OFFLINE state instead of the ONLINE state. To print, ONLINE must be lit; if it is not, press ONLINE.

If other messages and prompts appear on the control panel, answer the prompts and follow the directions as explained on page 188.

Power Paper Stacker (Option)



Legend:

- 1) Heavy Mode/Light Mode Switch
- 2) Stackers Cover

Figure 6: Power Paper Stacker

Chapter 2 Power Paper Stacker (Option)

The L5020 Paper Stacker works with a specially designed basket. The stacker can stack any paper in the following weight and width ranges:

Weight: 8 to 44 lbs/ream (68 to 165 g/m²) bond (17 inch x 22 inch), fanfold.

Width: 7 to 17.5 inches (178 to 445 mm) edge to edge.

As fanfold paper moves through the stacker, it is folded, allowing the paper to stack evenly as it falls into the basket. The basket is designed to stack approximately 1 box (3,000) sheets of paper. The basket is also designed to compensate for the natural tendency of the paper to crown as the height of the paper increases.

NOTE: Load the paper with the first perforation facing the printer. This allows the stacker to re-fold the paper as it was originally folded in the box.

Control Panel Commands

When setting up the operation of the stacker through the control panel there are two options:

- Into Stacker
- Bypass Stacker

If Bypass Stacker is chosen, paper travels over the stacking mechanism; the perforation on the paper is not broken.

The Control Panel path to these options is:

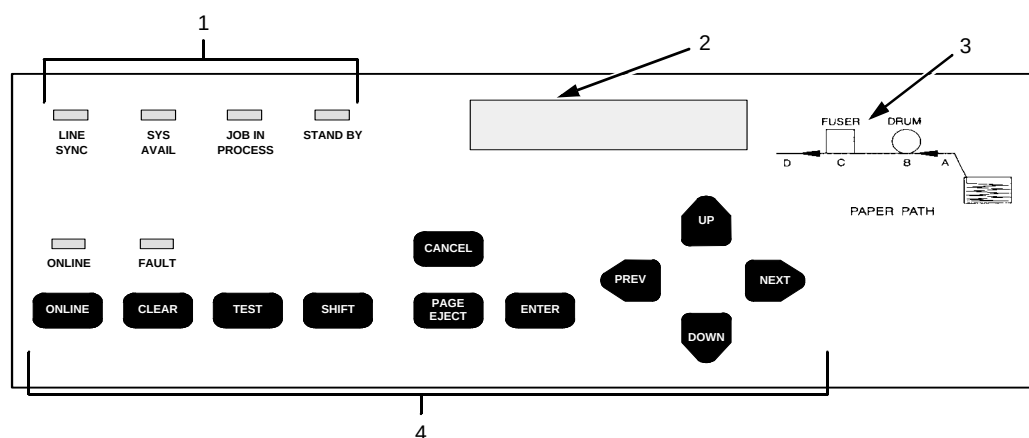
Paper Control > Paper Output > Into Stacker or Bypass Stacker

Heavy Mode/Light Mode Switch

The stacker has a manual switch to adjust its operation depending on the weight of the paper. If the paper is less than or equal to 34 pounds, set the switch to Light Mode. If the paper is heavier than 34 pounds set the switch to Heavy Mode. In Heavy Mode the stacker passes the paper through without actively breaking the perforation. To activate the switch, open the stacker cover, as shown on page 33.

Liquid Crystal Display (LCD)

Using The Control Panel



Legend:

- 1) Status Indicators
- 2) Liquid Crystal Display (LCD)
- 3) Paper Path Diagram
- 4) Function Keys

Figure 7: Control Panel

The control panel (Figure 7), is located on the top right side of the front cover.

The LCD, status indicators, and function keys are described in the following sections.

Liquid Crystal Display (LCD)

The liquid crystal display (LCD) displays messages, printer operating status, configuration options, and error codes.

Status Indicators

The status indicators display the current operational status of the printer.

LINE SYNC

Twinax interface only. Indicates there is activity on the line from the host computer.

SYS AVAIL

Twinax interface only. Indicates there is activity to the current address on the line.

JOB IN PROCESS

When the printer is receiving data or processing data, JOB IN PROCESS flashes. If data has been processed and is waiting to be printed, or has been printed but not yet fused and ejected by the printer, JOB IN PROCESS lights continuously.

JOB IN PROCESS does not light when the printer is not processing data, no data exists in the buffer, and the printer is not receiving data.

STAND BY

IMPORTANT

Do not press any control panel key when STAND BY is flashing. The printer may carry out unwanted commands.

STAND BY flashes while the printer is executing any control panel command, and while the printer is unavailable for printing due to its normal system activities, such as booting, printing its configuration, writing status information, and loading applications.

ONLINE

ONLINE is lit continuously when the printer is online (when the printer is ready to print and accept data from the host). It flashes when the printer is offline or when the printer stops because of an error.

FAULT

FAULT flashes when the printer is unavailable for printing because of an internal error.

Function Keys

The pressure-sensitive function keys are located directly below the status indicators. When pressing the keys, a “beep” verifies contact.

The function keys permit you to configure the options of the printer. You can access these options via a structured menu which is displayed on the LCD. To navigate through the options, use the UP, DOWN, NEXT, and PREV keys. Press ENTER to select an option that appears on the LCD.

The purpose of each function key (under normal printing mode) is defined below.

For specific procedures and information regarding the configuration menu, see Chapter 3.

NOTE: You can enable or disable the panel key sound via the configuration menu.

ONLINE Key

The ONLINE key toggles the printer online and offline.

- To place the printer online, press ONLINE until the ONLINE status indicator remains continuously lit. The LCD displays “ONLINE,” along with the name of the current emulation. The printer can now receive and process data and print.
- To place the printer offline, press ONLINE until the ONLINE status indicator blinks. The LCD displays “OFFLINE.” The printer stops processing and printing any new data, except for any pages in process.
- To start downloading files to the printer, hold down the ONLINE + PAGE EJECT keys while the power is cycling. See page 93 for more information.

NOTE: When the printer is not in an error state, pressing ONLINE in any level of the configuration menu causes the printer to accept any configuration changes you have entered and return to online status.

When the printer is in an error state, pressing ONLINE in any level of the configuration menu causes the printer to re-display the fault message.

CLEAR Key

In the fault state, press the CLEAR key to clear errors and reset the printer to the offline state (if all errors are cleared).

TEST Key

When the printer is offline, you can run a test print, as configured under the Test Print menu (see page 89), by pressing the TEST key. To stop the test print, press TEST again.

Pressing TEST when the printer is online has no effect.

SHIFT Key

This key does not have a function of its own. It is combined with other keys to modify their functions.

PAGE EJECT Key

The PAGE EJECT key performs the following functions when the printer is online:

When the JOB IN PROCESS status indicator lights steadily, pressing PAGE EJECT causes the printer to print all data in the printer. The page is then cut at the perforation (unless the Burst On Eject option is disabled).

IMPORTANT Do not press PAGE EJECT while JOB IN PROCESS is flashing, or your print job might become misaligned.

When the JOB IN PROCESS status indicator flashes, pressing PAGE EJECT causes the printer to attempt to print any data in the buffer. The paper motion caused by the page eject operation may interrupt the printing of data that is not currently in the buffer. Once the paper motion has occurred, the data that was not yet in the buffer should print. The page is then cut at the perforation (unless the Burst On Eject option is disabled).

Function Keys

To start downloading files to the printer, hold down the ONLINE + PAGE EJECT keys while the power is cycling. See page 93 for more information.

When the JOB IN PROCESS status indicator is not lit or flashing, PAGE EJECT has no effect.

Pressing the SHIFT + PAGE EJECT keys together moves the paper one page length without printing or cutting the paper. It can be used to feed the paper into (customer-supplied) postprocessing equipment.

ENTER Key

When you enter parameters in the configuration menu, press ENTER to select the value shown in the LCD. The printer confirms your selection by placing an asterisk (*) next to the value in the display. However, if the ENTER key is locked, "ENTER SWITCH LOCKED" appears and the value is not accepted.

CANCEL Key

The CANCEL key performs the following functions when the printer is offline:

- Cancels the current page in process
- Cancels any pages queued to print but not yet printed
- Cancels any input data not yet processed
- Clears the reprint buffers
- Cancels a download if one is in process. See Chapter 3 for more information.

UP And DOWN Keys

The UP and DOWN keys are used for the configuration menu:

- To unlock or lock the ENTER key, press UP + DOWN at the same time when the printer is offline.
- To enter the configuration menu, press DOWN when the printer is offline.
- To move between the different levels in the configuration menu, either press UP or DOWN as needed.

NEXT And PREV Keys

The NEXT and PREV keys are used to move between the parameter options on the current level of the configuration menu. Press NEXT or PREV to move forward or backward through parameter options.

3

Printer Configuration

Printer Configuration

IMPORTANT Configuration directly affects printer operation. Do not change the configuration of your printer until you are thoroughly familiar with the procedures in this chapter.

In order to print data, the printer must respond correctly to interface signals and commands received from the host computer.

Configuration is the process of matching the printer's operating characteristics to the host computer's. The characteristics that define the printer's response to signals and commands received from the host computer are called configuration parameters and are found in the configuration menus. Configuration menu diagrams are shown later in this chapter.

Configuration parameters are retrieved from flash memory, or set from the control panel. This chapter explains how to set and save parameters with the control panel.

Unlocking And Locking The Configuration Menu

In order to configure the printer with the control panel, you need to unlock the ENTER key, which is in a locked state by default. The locked state secures your configuration, preventing alteration.

Unlocking The Configuration Menu

Step	Press	LCD Message
1. Place the printer offline	ONLINE 	OFFLINE PAPER CONTROL
2. Unlock the ENTER key (the LCD message appears briefly).	 + 	ENTER SWITCH UNLOCKED
3. From this point, either print or modify your current configuration.		

Locking The Configuration Menu

Step	Press	LCD Message
1. At any place within the menu, you can re-lock the ENTER key.	 + 	ENTER SWITCH LOCKED
2. Place the printer online. The second line of the LCD varies, depending on which emulation is loaded in the printer memory.	ONLINE 	ONLINE LINEPRINTER+

Moving Within The Configuration Menu

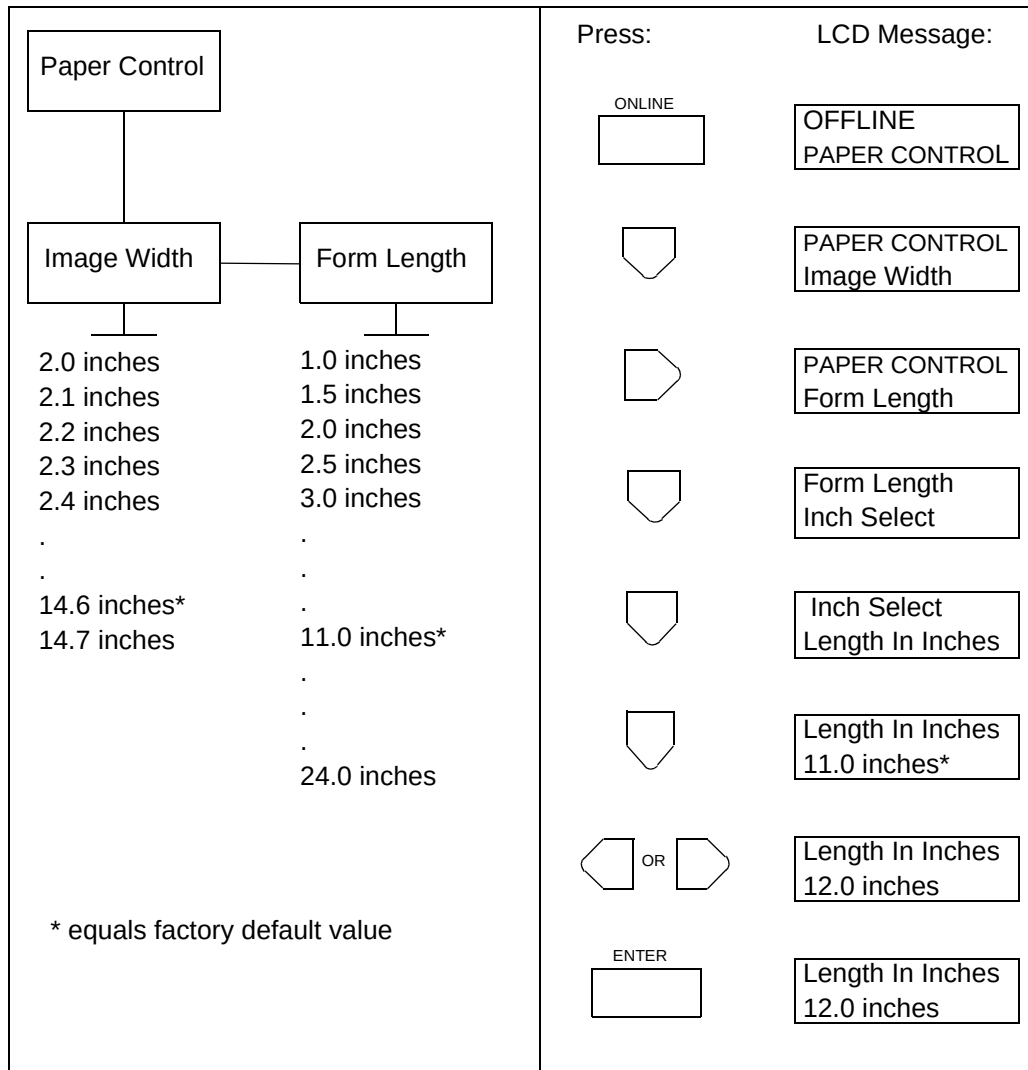
Movement within the configuration menus is done with the UP, DOWN, PREV, and NEXT keys on the control panel. The configuration procedure discusses this in more detail. Do not make any configuration changes until you have a printout of your current configuration. (See page 44.)

The following figure shows how to change a menu option. The illustration is divided into two parts:

Moving Within The Configuration Menu

The left side shows a portion of a configuration menu and the right side shows the keys to press to access a particular parameter and the messages that display after you press each key.

The example shown configures the printer for a form length of 12 inches. Follow these guidelines to move through all of the configuration menus.

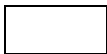


Printing The Current Configuration

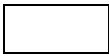
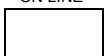
We recommend that you print and store your configurations for future reference. The printout provides a list of the parameters you set when you configured the printer. Each parameter is defined later in the chapter.

NOTE: Whenever you make changes to your configuration parameters, be sure to print the configuration and save it for future reference.

To print the current configuration, follow the steps listed below.

Step	Press	LCD Message
1. Place the printer offline.	ON LINE 	OFFLINE PAPER CONTROL
2. Unlock the ENTER key.	 + 	ENTER SWITCH UNLOCKED
3. Scroll through the menu until you reach the appropriate menu.	 OR 	OFFLINE HOST INTERFACE
4. Select the menu to access available parameters or submenus.		HOST INTERFACE Centronics
5. Scroll through the submenus or parameters until you reach the one you want.	 OR 	HOST INTERFACE Serial
6. Select this submenu parameter to access the value options.		Serial Host Protocol
7. Scroll through the submenu options until you reach the desired value.	 OR 	Serial Baud Rate

Printing The Current Configuration

Step	Press	LCD Message
8. Select the parameter to access the value options.		Baud Rate 9600 BAUD*
9. Scroll through the parameter value options until you reach the desired value.	 OR 	Baud Rate 38400 BAUD
10. Select the current value.	ENTER 	Baud Rate 38400 BAUD*
11. Continue doing this to make other changes as needed. At any time press UP to return to a higher level.		
12. Lock the ENTER key.	 + 	ENTER SWITCH LOCKED
13. Do one of the following to save your changes: - To temporarily save the changes (until the printer is turned off), place the printer online. - To permanently save the changes, see the following section. Place the printer online.	ON LINE 	ONLINE LINEPRINTER+

Factory Settings

The following table lists the factory set configuration defaults. These values are available for loading at any time, and are maintained in the printer until a new configuration is loaded.

Paper Control

Image Width	14.6 inches
Form Length	11.0 inches
Paper Length	Auto. Select
Fanfold Output	Into stacker
Horizontal Image Shift	0/100 inches
Vertical Image Shift	0/100 inches
Toner	3
Reprint on Fault	Enable
Paper Type	Standard
Burst on Eject	Enable

Mode	LinePrinter+
-------------	--------------

Config. Control

Load Configuration	0
Save Configuration	1
Print Configuration	Current
Delete Configuration	1
Power-up Configuration	0
Protect Saved Configuration	Disable

Factory Settings

Host Interface

Centronics

Data Bit 8	Enable
Paper Inst Line	Disable
Data Polarity	Standard
Strobe Polarity	Standard
ACK Polarity	Standard
Busy Polarity	Standard
Slct Polarity	Standard
Fault Polarity	Standard
Paper Inst Pol	Standard
PE Polarity	Standard
NFAULT/PE Ctl	Act Together

Dataproductions

Data Bit 8	Enable
Paper Inst Line	Disable
Data Polarity	Standard
Strobe Polarity	Standard
Data Req Pol	Standard
Ready Polarity	Standard
Online Polarity	Standard
Paper Inst Polarity	Standard

Serial

Host Protocol	None
Baud Rate	9600 baud

Chapter 3 Printer Configuration

Data Bits	8 bits
Stop Bits	1 bit
Parity	None
DTR Function	On/Offline&Buf
RTS Function	On/Offline&Buf
DTR Polarity	Normal
RTS Polarity	Normal
Buffer Size	8192 bytes
Number Buffers	2 buffers
FIFO Trigger	14 bytes
Diagnostic	None
Series 1 Poll	0
Series 1 Delay	0+ Msec
Series 1 Idle	Disable
Miscellaneous	
Panel Key Sound	On
Alarm	On
Power-up State	Online
Hex Dump Mode	Disable
PTX SETUP Options	
Setup Parse	Disable
Setup SFCC	21h
Display Language	English
File System	
Overwrite	Enable

Factory Settings

View Files	File 1
------------	--------

Delete Files	File 1
--------------	--------

Optimize and Reboot	
---------------------	--

Print File List	
-----------------	--

Font Memory

Max Char Memory	300 KBytes
-----------------	------------

Max Cache Memory	200 KBytes
------------------	------------

Max Cache Size	900 Characters
----------------	----------------

Max Cached Char	01 KBytes
-----------------	-----------

Max Fonts Loaded	05 Fonts
------------------	----------

Font Weight

Standard Chars.	115
-----------------	-----

Bold Chars.	259
-------------	-----

Extra Bold Chars.	269
-------------------	-----

Installed Fonts

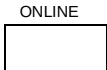
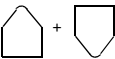
Virtual Printer

Virtual Printer	LP+
-----------------	-----

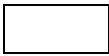
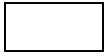
Changing Printer Configurations

IMPORTANT In order to properly configure the printer, it is important that you have a current configuration printout, as described previously. From this printout, determine which parameters you need to change for the printer to operate correctly with the host computer, or your specific applications.

To change printer settings such as paper length, emulation, and host I/O interface, perform the following steps:

Step	Press	LCD Message
1. Place the printer offline.		OFFLINE PAPER CONTROL
2. Unlock the ENTER key.	 + 	ENTER SWITCH UNLOCKED
3. Scroll through the menu until you reach the appropriate menu.	 OR 	OFFLINE HOST INTERFACE
4. Select the menu to access available parameters or submenus.		HOST INTERFACE Centronics
5. Scroll through the submenus or parameters until you reach the one you want.	 OR 	HOST INTERFACE Serial
6. Select this submenu parameter to access the value options.		Serial Host Protocol
7. Scroll through the submenu options until you reach the desired value.	 OR 	Serial Baud Rate

Changing Printer Configurations

Step	Press	LCD Message
8. Select the parameter to access the value options.		Baud Rate 9600 BAUD*
9. Scroll through the parameter value options until you reach the desired value.	 OR 	Baud Rate 38400 BAUD
10. Select the current value.	ENTER 	Baud Rate 38400 BAUD*
11. Continue doing this to make other changes as needed. At any time press UP to return to a higher level.		
12. Lock the ENTER key.	 + 	ENTER SWITCH LOCKED
13. Do one of the following to save your changes: - To temporarily save the changes (until the printer is turned off), place the printer online. - To permanently save the changes, see the following section. Place the printer online.	ONLINE 	ONLINE LINEPRINTER+

Saving New Configurations

IMPORTANT

If you do not save your configuration, all of the new values will be lost when you turn off the printer.

You can save up to eight different configuration sets to meet eight unique print job requirements. For example:

Config. 0: Factory Default (This cannot be altered.)

Config. 1: Selects Image Width of 4 inches
Selects Paper Length of 10 inches.

Config. 2: Selects Image Width of 8 inches
Selects Paper Length of 11 inches.

The configurations are saved and stored in flash memory for later use.

NOTE: If the “Protect Save CFG” option is enabled, the new configuration is not saved unless the existing configuration has been deleted.

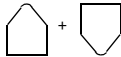
Save Configuration

Save configuration allows you to save up to eight different configurations to meet different print job requirements. Configuration 0 is a factory-preset configuration that cannot be changed or saved.

Perform the following steps to save a new configuration:

Step	Press	LCD Message
1. Place the printer offline.	ON LINE 	OFFLINE PAPER CONTROL
2. Unlock the ENTER key.	 + 	ENTER SWITCH UNLOCKED
3. Scroll through the menu until you reach the appropriate menu.	 OR 	OFFLINE CONFIG. CONTROL
4. Select the Config. Control menu.		CONFIG. CONTROL Load Config.
5. Scroll through the Config. Control menu until you reach "Save Config."	 OR 	CONFIG. CONTROL Save Config.
6. Select Save Config.		Save Config. 1*
7. Scroll through the options (1-8) until you reach the desired value.	 OR 	Save Config. 4
8. Select the desired value. An asterisk appears next to it.	ENTER 	Save Config. 4*

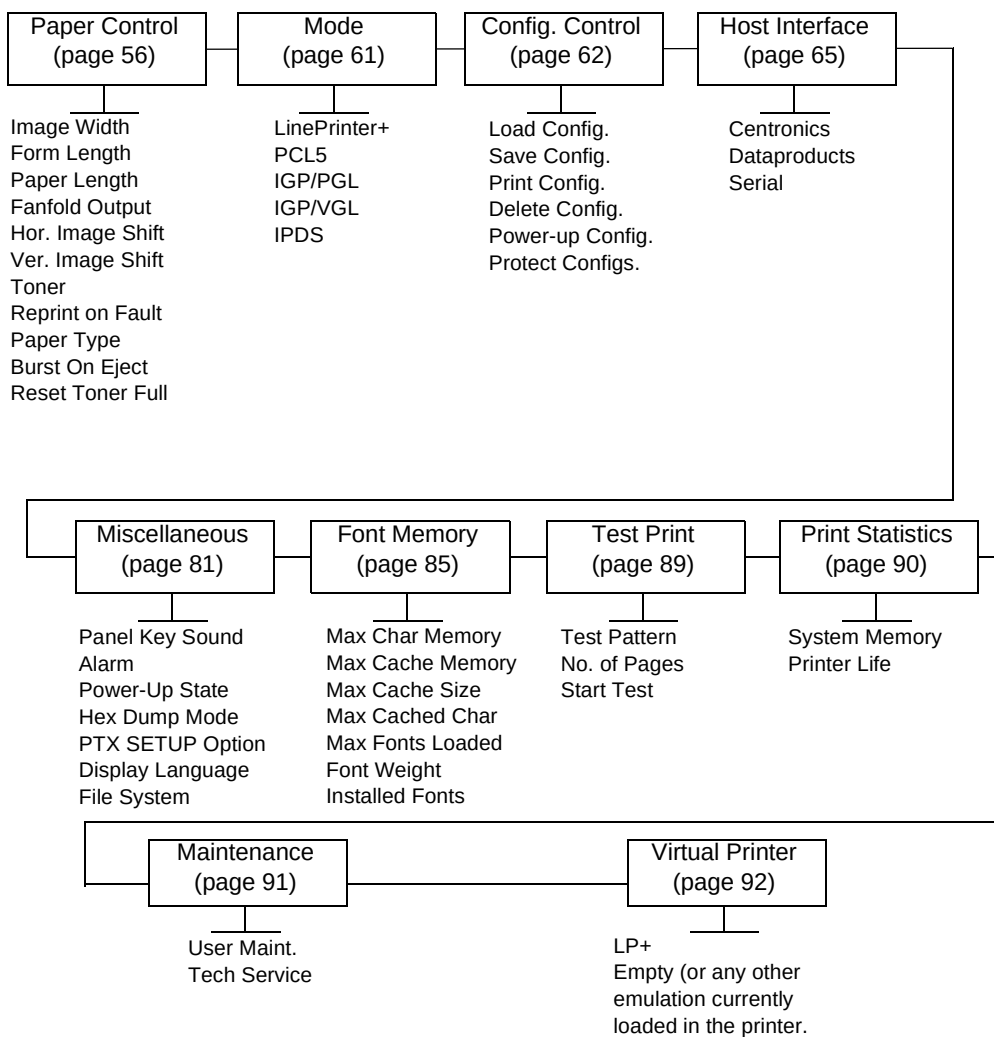
Chapter 3 Printer Configuration

Step	Press	LCD Message
If the configuration number has been previously saved and the "Protect Save CFG" option is enabled, this error message appears briefly:		CFG FILE EXISTS DELETE FIRST
If the configuration number has not been previously saved or the "Protect Save CFG" option is disabled, the STAND BY light flashes, and this message appears:		STANDBY...
		Save Config. 4*
9. Lock the ENTER key.		ENTER SWITCH LOCKED
10. Place the printer online (LCD depends on printer emulation).		ONLINE LINEPRINTER+

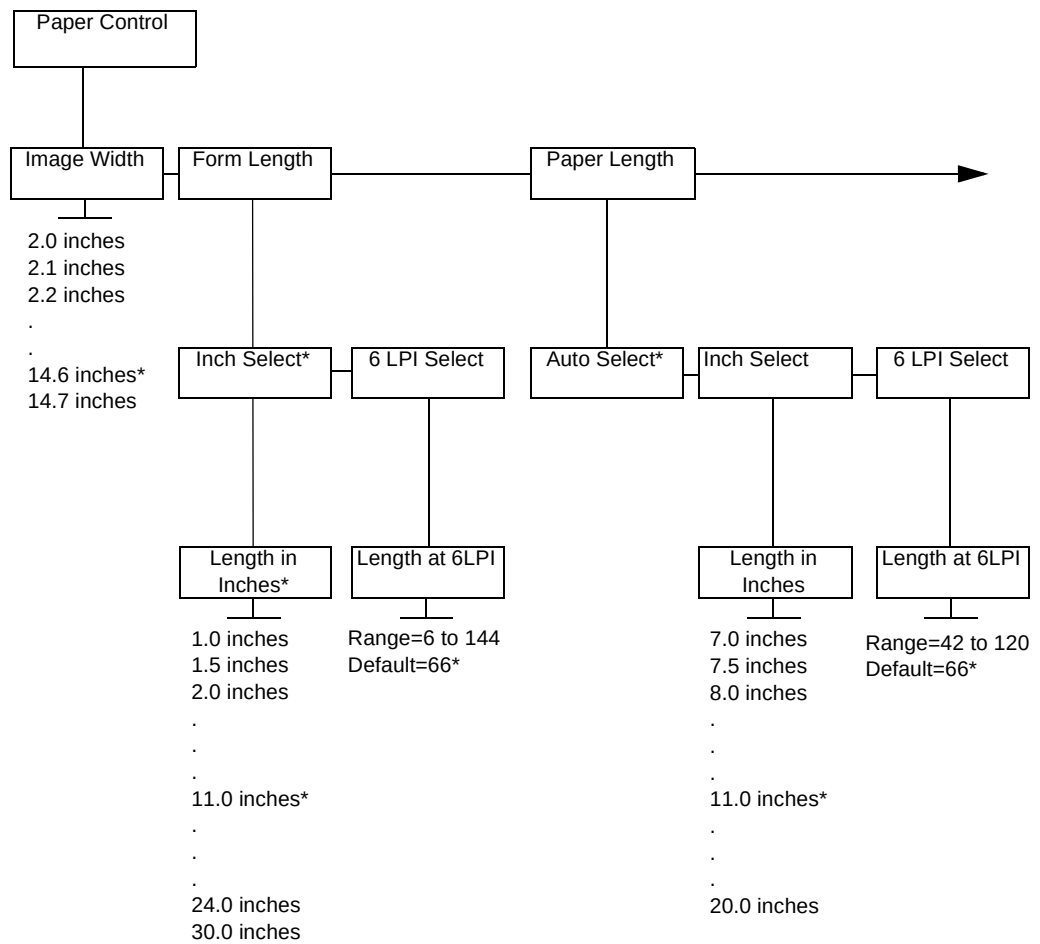
NOTE: To make the new printer configuration active at power-up, select the configuration as the "Power-Up Config."

Configuration Menus

The following pages describe the configuration menus and their options. For details on a particular menu, see the specified page.



Paper Control Menu



Paper Control Menu

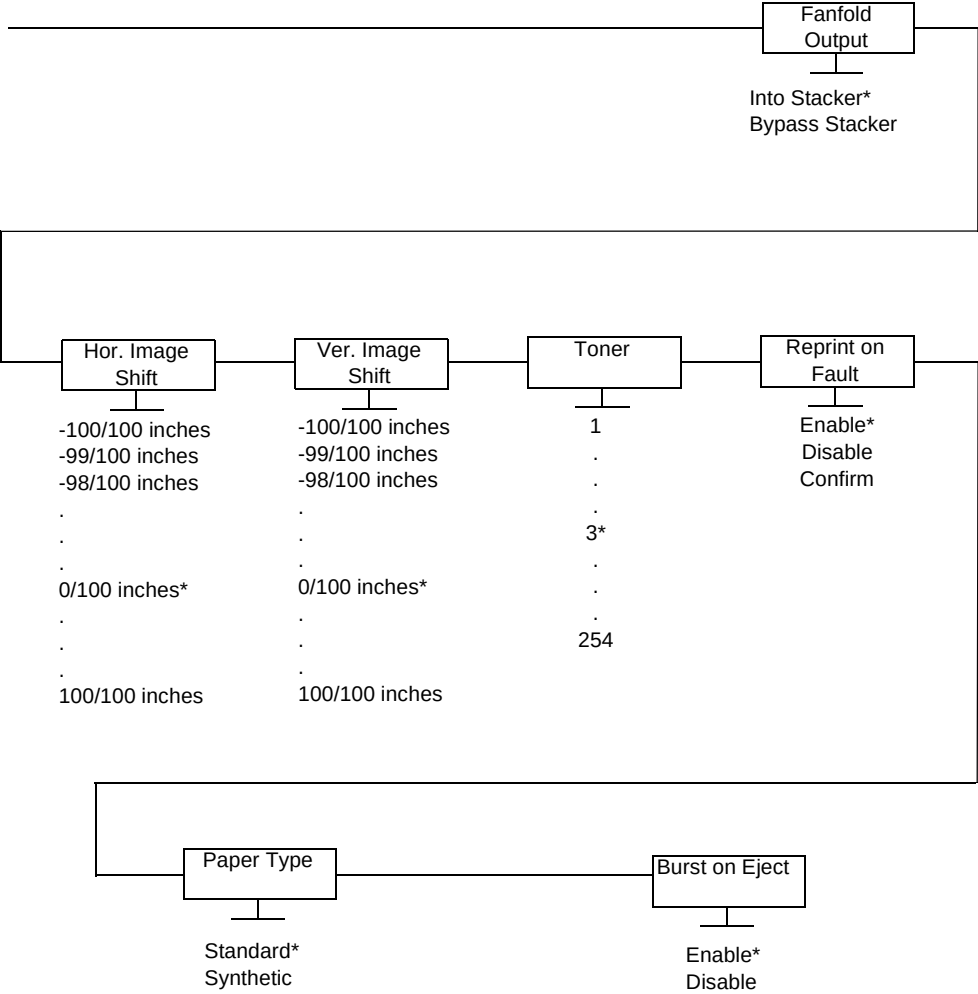


Image Width

Image Width specifies the width of the image to be printed. The allowable range is 2.0 to 14.7 inches, in 0.1 inch increments. The factory default is 14.6 inches

Form Length

Form Length is the logical form length for fanfold paper. You can specify the form length in either of two ways: in inches, or in the number of print lines (at six lines per inch).

- Inch Select/Length in Inches (the default). This selection allows you to set the form length in inches. The range is from 1.0 to 30.0 inches, in one-half inch increments. The default is 11.0 inches.
- 6 LPI Select/Length at 6LPI. This selection allows you to set the form length in lines. The range is from 6 to 144 in one line increments. The default is 66 lines.

Paper Length

Paper Length is the physical form length for fanfold paper (the vertical perforation to perforation distance). You can specify the paper length in three ways: Auto Select, inches, or the number of print lines (at six lines per inch).

- Auto Select (the default). The printer uses the current setting of the "Form Length" parameter to find the best physical paper length within the valid range, and then uses that value. If the form length parameter setting is within the valid range for the paper length parameter, the printer uses the value for both the form length and paper length parameters. If the form length parameter is outside the valid range for the paper length parameter, the printer finds the closest multiple or divisor.

For example, a form length parameter setting of 10 inches results in a paper length setting of 10 inches, as 10 inches is within the valid range for form length and paper length parameters. A form length setting of 24 inches results in a paper length setting of 12 inches; 24 is above the valid range.

A form length setting of five inches results in a paper length setting of 10 inches, as five is below the valid range.

- Inch Select/Length in Inches. This allows you to set the paper length in inches. The range is 7.0 to 20.0 inches, in one-half inch increments. The default is 11.0 inches.
- 6 LPI Select/Length at 6LPI. This menu selection allows you to set the paper length in lines. The range is from 42 to 120 lines, in 1 line increments. The default is 66 lines.

Fanfold Output

The Fanfold Output option specifies the paper path through the stacker. You can select either into the stacker (default) or to bypass the stacker.

Horizontal Image Shift

Horizontal Image Shift specifies the amount to shift an image to the right for precise positioning on the page. The actual width of the image is not affected. The allowable range is -1.0 to 1.0 inches, in 1/100 inch increments. The default is 0.0 inches.

Vertical Image Shift

Vertical Image Shift specifies the amount to shift an image down for precise positioning on the page. The actual height of the image is not affected. The allowable range is -1.0 to 1.0 inches, in 1/100 inch increments. The default is 0.0 inches.

Toner

The Toner option sets the frequency interval for dispensing toner. The higher the number selected, the less frequently toner is dispensed. The allowable range is from 1 to 254. The default is 3.

Reprint On Fault

Reprint on Fault enables (default) or disables automatic reprinting after a fault condition occurs. If Confirm is selected, the printer displays a message asking if you want to reprint.

Paper Type

Paper Type allows you to set the printer for either standard or synthetic paper. The default is Standard; use this setting for most types of media. Use the Synthetic setting for special types of media such as plastic cards.

Burst On Eject

Burst on Eject allows you to use roll-feed paper that cannot be cut (separated) or parked (backed out of the print engine).

- With fanfold paper, whenever you change the page size or press the PAGE EJECT key, the printer automatically separates the currently loaded paper at the perforation, and backs the unprinted paper out of the engine.
- With roll-feed paper, the printer cannot separate the paper because there are no perforations. Burst on Eject must be set to Disable. The perforations separator is not used, and paper is never rolled back out of the engine. If you need to remove the paper before the entire roll is used, it must be manually removed.

When Burst on Eject is disabled, it allows these switch functions:

- PAGE EJECT: When you press PAGE EJECT or send a ~PAGE EJECT command, the paper is not separated and is not rolled back into the printer. Instead, enough forms are inserted to fuse and move all pages physically out of the printer. The exact distance depends on the current Paper Length selection. The paper moves a minimum of 25.5 inches.

The printer uses Paper Length and not Form Length for paper motion. If the current Form Length is not a multiple of 1/6 inch, the exact distance the paper is moved is not a multiple of the form size. When using a preprinted roll-feed form, the physical top-of-form may be lost.

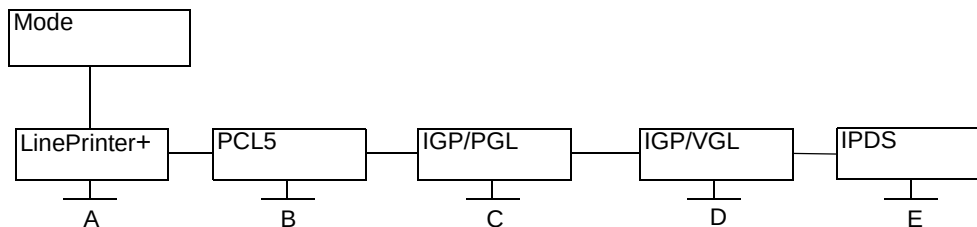
- FORM SIZE CHANGE: A form size change operates the same as pressing the PAGE EJECT key. Instead of separating the form, enough form feeds are inserted to move the printed pages out of the printer.

Mode Menu

When you load a configuration having a different Paper Length, the same operation occurs: the printer sends form feeds rather than cutting the page and reverse-feeding it out of the printer.

- **FAULT HANDLING:** In normal operation, roll-fed paper is not removed from the printer. However, after a fault that requires reprinting (such as a paper jam), you must remove the paper and reseal it in the tractors. The control panel indicates when this is necessary.
- **BOOT:** When powering on, the printer does not cut the paper in the printer or roll it back out of the printer.

Mode Menu



See also the following documents:

A. *LinePrinter Plus Emulation for LaserLine Printers Programmer's Reference Manual*

B. *PhoenixPage PCL5 Emulation Operator's Guide*

C. *IGP/PGL Emulation for LaserLine Printers Programmer's Reference Manual*

D. *IGP/VGL Emulation for LaserLine Printers Programmer's Reference Manual*

E. *IPDS Emulation for LaserLine Printers Programmer's Reference Manual*

NOTE: The order and number of options displayed in this menu structure varies depending on the emulations that are installed.

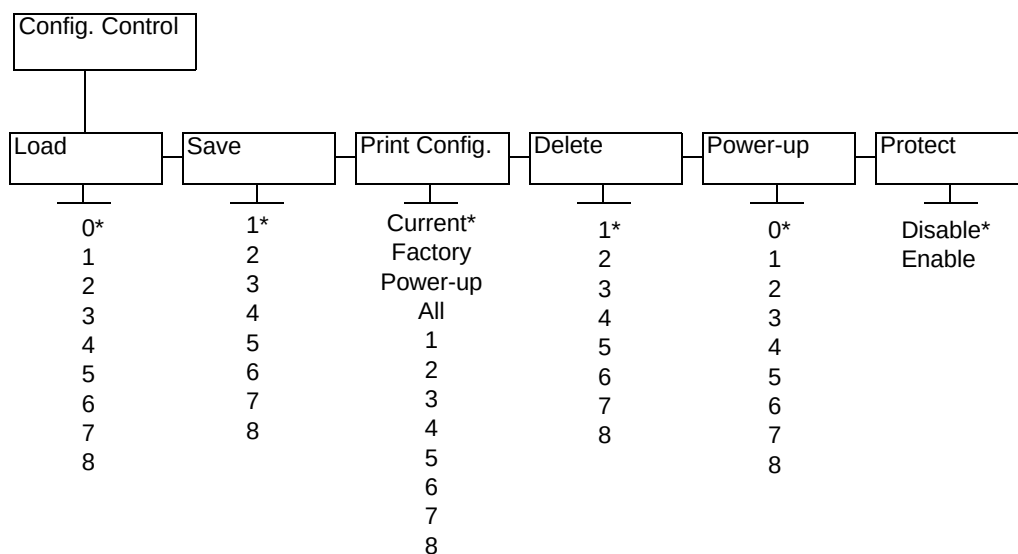
“Mode” refers to the emulation software that you use. Your printer comes equipped with the Printronix LinePrinter Plus emulation software (which emulates an impact printer). The IGP/PGL, IGP/VGL, PhoenixPage PCL5, and IPDS software emulations are available as options.

Chapter 3 Printer Configuration

When you turn on the printer, it reads the Flash memory as part of its initialization, to determine what emulations are installed. Based on this information, the printer then creates the appropriate selections on the Mode menu. During power-up, the printer also loads the power-up set of configuration values. The power-up set is the same as the factory set until you save a new set to power-up.

NOTE: Each emulation can have its own set of configuration options in addition to those that are in the printer system list. For information on these unique configuration settings, see the appropriate emulation manual.

Config. Control Menu



Load Configuration

The printer can store up to eight configurations. This option allows you to select and load a specific configuration.

The factory default for loading is configuration 0. Note that configuration 0 is a factory-preset configuration that cannot be changed and is always available for loading.

Save Configuration

Save configuration allows you to save up to eight different configurations to meet different print job requirements.

Configuration 0 is a factory-preset configuration that cannot be changed or saved.

NOTE: If the “Protect Save CFG” option is enabled, the new configuration is not saved unless the existing configuration has been deleted.

Print Configuration

Print configuration allows you to output a listing of various stored printer configuration parameters. You can print the following configurations:

- Current
- Factory
- Power-up
- All
- Any of the customized configurations (1 through 8)

For details on making a configuration printout, see page 44.

NOTE: The information (Power-Up Time, Level A Pages, etc.) that is displayed on the LCD via the Print Statistics menu is printed only as part of the printout for the Current configuration. The Print Statistics information is not printed under any of the printouts for customized configurations. Thus, if you want to make a printout that includes the Print Statistics information, you must select either the “Current” configuration or “All” configurations from the Print Configuration menu. The Print Statistics menu is detailed on page 90.

Delete Configuration

Delete configuration allows you to delete a configuration file. You can delete one or all of your eight customized configurations.

Configuration 0 is a factory-preset configuration and cannot be changed or deleted.

Power-Up Configuration

Power-up configuration allows you to specify one of nine (0-8) configurations to be used upon printer power-up. The factory default for power-up is configuration 0.

Protect Save CFG

The Protect Save CFG (protect saved configuration) option allows you to specify whether or not a new configuration should “overwrite” an existing configuration when you activate the “Save Config” option:

- When disabled (default), the new configuration overwrites the existing configuration. There is no protection set for the former configuration.
- When enabled, the new configuration does not overwrite the existing configuration, and the following is displayed:

CFG FILE EXISTS
DELETE FIRST

- Therefore, you must delete an existing configuration before trying to save a new configuration, as it is protected.

Host Interface Menus

The printer provides the following host interface options:

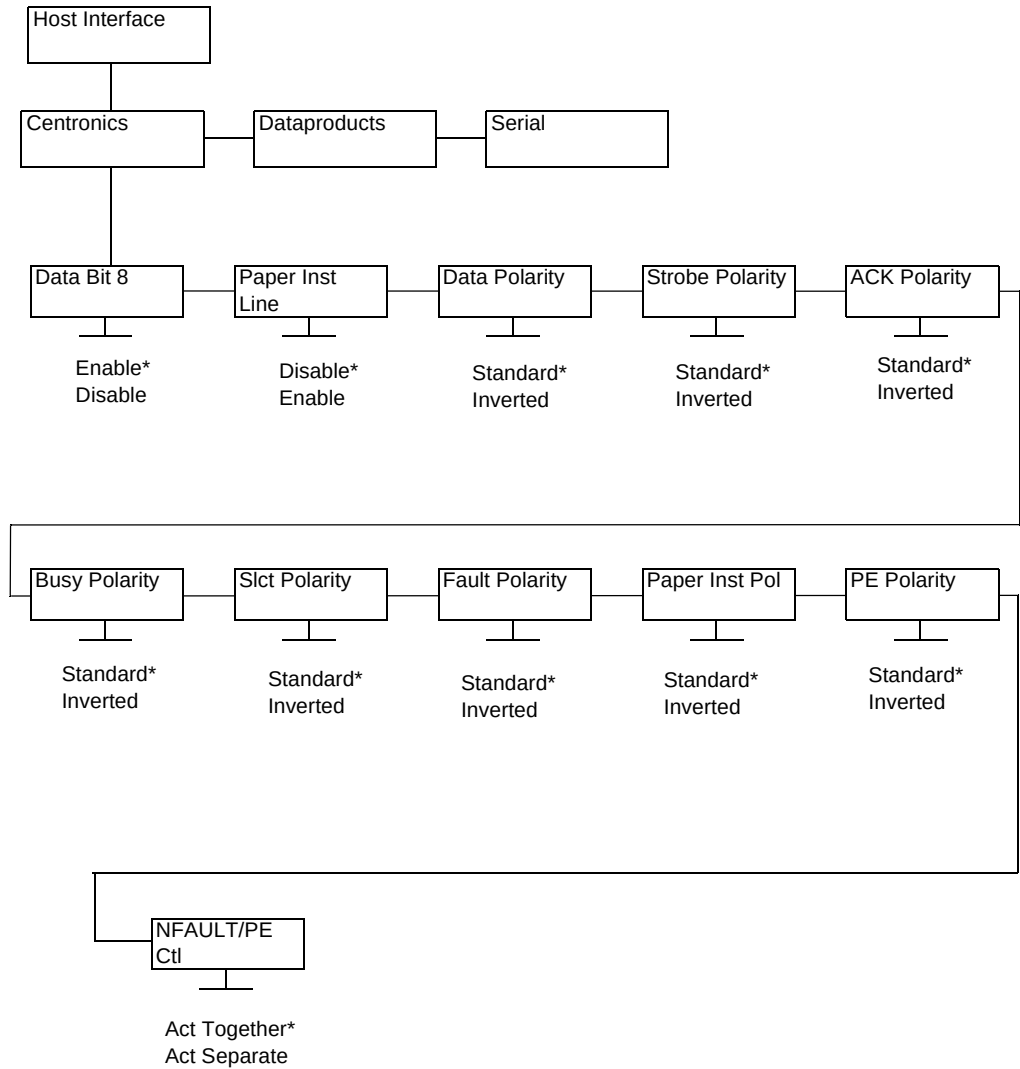
- Centronics parallel
- Dataproducts parallel (requires optional cable adapter, p/n 703316-001)
- Serial (RS-232 or RS-422)

NOTE: In addition to the software configuration for the serial interface, a toggle switch on the right side of the printer (adjacent to the RS-232/422 connector) must be set for either RS-232 or RS-422. The location of the RS-232/422 toggle switch is shown on page 218.

The configuration options for each interface type are shown in the illustrations on the following pages. Descriptions of the options follow each illustration. Set these options to meet the specific data communication requirements of the host computer as well as the application running on the host.

NOTE: For interface connector pin assignments and additional host interface signal information, see Appendix C, "Host I/O Interfaces."

Centronics Parameters



Data Bit 8

Values: Enable (default) or Disable.

Normally, this parameter is enabled. It allows access to the extended ASCII character set.

Paper Inst (Instruction) Line

Values: Enable or Disable (default).

The Paper Instruction line (PI line) controls paper motion. It is dependent on your host computer.

Data Polarity

Values: Standard (default) or Inverted.

This parameter must be set to match the Data Polarity of your host computer.

There are normally seven or eight data bits that define each ASCII character sent from the host computer to the printer. The bits are usually high-true.

Strobe Polarity

Values: Standard (default) or Inverted.

This parameter must be set to match the Data Strobe Polarity of your host computer.

When the host computer sends a data strobe signal, it is indicating that it has placed data on the data bus and that the data is valid (i.e., enough time has elapsed for the data lines to stabilize). The data strobe signal forces the printer to read the data lines into its input buffer.

ACK Polarity

Values: Standard (default) or Inverted.

This parameter must be set to match the ACK signal polarity of your host computer.

The printer sends a low-true signal called ACK (acknowledge) to the host to indicate that it has received a data byte from the host and is ready to accept more data.

Busy Polarity

Values: Standard (default) or Inverted.

This parameter must be set to match the Busy signal polarity of your host computer.

When the printer is busy and is not ready to receive more data, it sends a Busy signal to the host computer.

Slct (Select) Polarity

Values: Standard (default) or Inverted.

This parameter must be set to match the Select signal polarity of your host computer.

The high-true signal Select is sent by the printer to the host computer. The Select signal indicates the printer is online, no error conditions exist, and that the printer is ready to receive data.

Fault Polarity

Values: Standard (default) or Inverted.

This parameter must be set to match the Fault signal polarity of your host computer.

When the printer detects a paper error or a fatal machine check, it sends a Fault signal to the host, which in turn stops sending any more data.

Paper Inst (Instruction) Polarity

Values: Standard (default) or Inverted.

This parameter must be set to match the PI line signal polarity of your host computer.

The Paper Instruction line (PI line) controls paper motion.

PE (Paper Empty) Polarity

Values: Standard (default) or Inverted.

This parameter must be set to match the PE signal polarity of your host computer.

During printing, if a paper out, paper jam, or cover open error occurs, the printer sends a Paper Empty (PE) signal to the host telling it not to send any more data.

NFAULT/PE Ctl

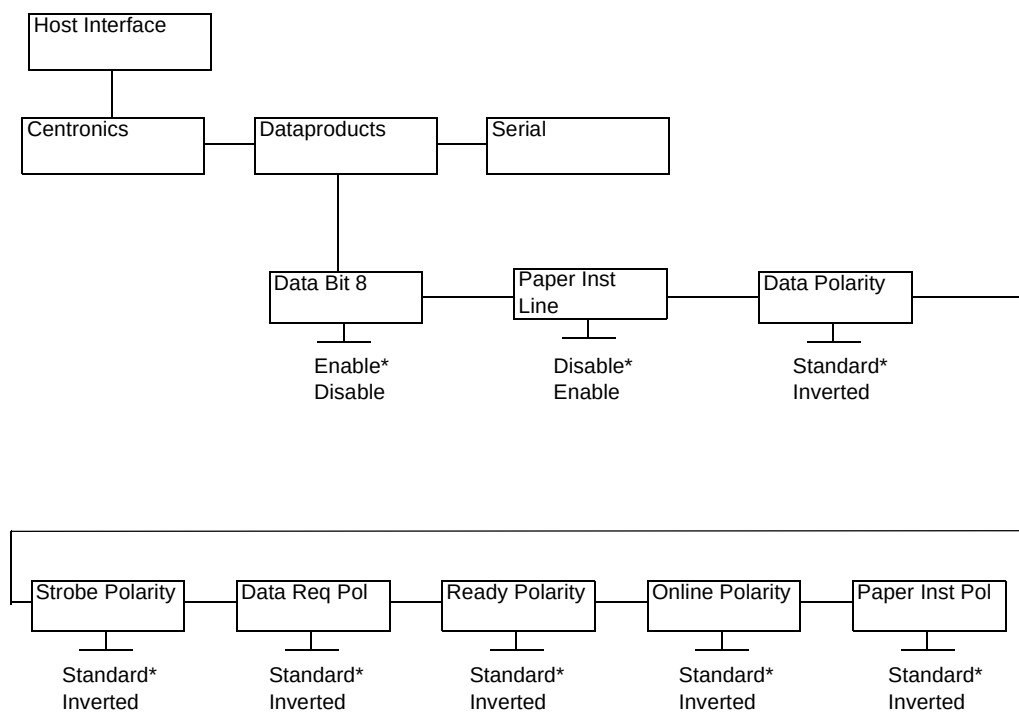
Values: Act Together (default) or Act Separate.

This parameter must be set to match your host computer.

The NFAULT/PE Control parameter controls the operation of the No Fault (NFAULT) and Paper Empty (PE) signals sent to the host computer.

- When set to Act Together, the two signal lines work together: When NFAULT is high, PE is low.
- When set to Act Separate, the printer sets the two signal lines independently: Paper faults control the state of the PE signal, and all other faults control the state of the NFAULT signal.

Dataproducts Parameters



Data Bit 8

Values: Enable (default) or Disable.

Normally, this parameter is enabled. It allows access to the extended ASCII character set.

Paper Inst (Instruction) Line

Values: Enable or Disable (default).

The Paper Instruction line (PI line) controls paper motion. It is dependent on your host computer.

Data Polarity

Values: Standard (default) or Inverted.

This parameter must be set to match the Data signal polarity of your host computer.

There are normally seven or eight data bits that define each ASCII character sent from the host computer to the printer. The bits are usually high-true.

Strobe Polarity

Values: Standard (default) or Inverted.

This parameter must be set to match the Data Strobe signal polarity of your host computer.

When the host computer sends a data strobe signal, it is indicating that it has placed data on the data bus and that the data is valid (i.e., enough time has elapsed for the data lines to stabilize). The data strobe signal forces the printer to read the data lines into its input buffer.

Data Req (Request) Polarity

Values: Standard (default) or Inverted.

This parameter must be set to match the Data Request signal polarity of your host computer.

Data Request is a high-true signal sent by the printer requesting data from the host.

Ready Polarity

Values: Standard (default) or Inverted.

This parameter must be set to match the Ready signal polarity of your host computer.

When the printer is ready to receive data, it sends a Ready signal to the host.

Online Polarity

Values: Standard (default) or Inverted.

This parameter must be set to match the Online signal polarity of your host computer.

The printer sends an Online signal to the host indicating that communication can be accomplished whenever the Ready signal is true.

Paper Inst (Instruction) Polarity

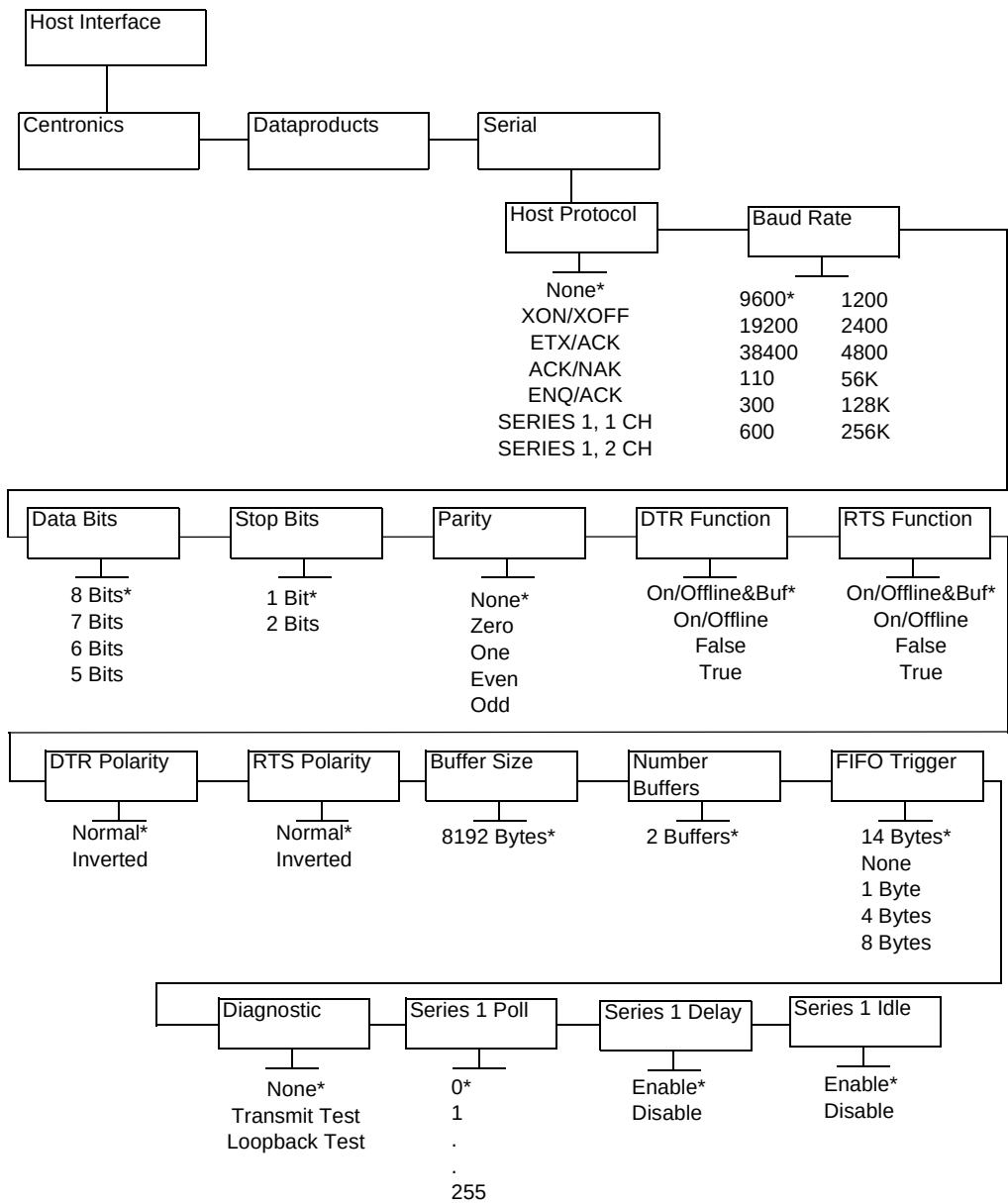
Values: Standard (default) or Inverted.

This parameter must be set to match the PI line signal polarity of your host computer.

The Paper Instruction line (PI line) controls paper motion.

Serial Parameters (RS-232 And RS-422)

Serial Parameters (RS-232 And RS-422)



Host Protocol

The Host Protocol parameter allows you to select the software flow control protocol used for communications between the printer and the host computer. You can also turn off software flow control.

Values: None, XON/XOFF, ETX/ACK, ACK/NAK, ENQ/ACK, SERIES 1, 1 CH, or SERIES 1, 2 CH.

This parameter must be set to match your host computer.

The actions for each of the parameter values are as follows:

None (default)

When you select None, the software flow control between the printer and the host is disabled.

XON/XOFF

NOTE: XON means “transmit on;” XOFF means “transmit off.”

When you select the XON/XOFF protocol, the printer does the following:

- When not ready to receive data (i.e., offline or full data buffer), the printer sends ASCII code DC3 (Device Code 3, hex 13, XOFF) to the host.
- When ready to receive data (i.e., online and empty data buffer), the printer sends ASCII code DC1 (Device Code 1, hex 11, XON) to the host.

ETX/ACK

The ETX/ACK protocol enables the flow of communication to the printer by sending a block of data, and ending the block with an End of Text (ETX) signal. When the printer receives the ETX signal, it acknowledges the signal, thereby indicating it has received the entire block of data.

ACK/NAK

The ACK/NAK protocol gives the printer a means to acknowledge it has either accepted a transmission (ACK) or did not receive a transmission (NAK).

Serial Parameters (RS-232 And RS-422)

ENQ/ACK

The ENQ/ACK protocol enables the flow of communication to the printer by sending a block of data, and ending the block with an Enquiry (ENQ) signal. When the printer receives the ENQ signal, it acknowledges the signal, thereby indicating it has received the entire block of data.

SERIES 1, 1 CH

When you select the Series 1 with 1 Character protocol, the printer does the following:

- When not ready to receive data (buffer 75% full), the printer sends a buffer full response character to the host.
- When ready to receive data (buffer drops to 50% full), the printer sends a buffer empty response character to the host.
- If the buffer ever fills completely, the printer sends a buffer full response character to the host every time it receives a character from the host.
- In addition, whenever the printer state changes from online to offline (or vice-versa), the printer sends the appropriate response character to the host.

The printer uses different response characters to represent buffer full and buffer empty, depending on whether it is online or offline. These response characters are listed in the following table:

Online State	Buffer State	Response Character
Online	Buffer Empty	CR
	Buffer Full	3
Offline	Buffer Empty	0
	Buffer Full	2

With the SERIES 1, 1 CH protocol selected, if the printer receives a Series 1 poll character from the host, the printer removes the poll character from its input data stream and discards it.

Chapter 3 Printer Configuration

After a pause called the poll delay, the printer replies to the host by sending the appropriate response character. (See preceding table.)

During a poll delay, if the printer receives another poll character, the printer merely discards it. However, if a transition (from buffer full to buffer empty or from online to offline) occurs during a poll delay, the printer sends the response character appropriate to the new printer state at the end of the delay.

If you enable the Series 1 Idle parameter, then whenever the buffer is less than 75% full, the printer sends a response character to the host every two seconds.

You can select the poll character and the poll delay time from the printer control panel. You can also enable or disable Series 1 Idle from the control panel.

NOTE: When using the SERIES 1, 1 CH protocol, be careful with the transmission of binary data (control codes, bit images, etc.) since the printer discards poll characters.

SERIES 1, 2 CH

When you select the Series 1 with 2 Characters protocol, the printer behaves exactly the same as the Series 1 with 1 Character protocol, except that the printer sends two-character responses to the host. These response characters are listed in the following table:

Online State	Buffer State	Response Characters
Online	Buffer Empty	1 CR
	Buffer Full	3 CR
Offline	Buffer Empty	0 CR
	Buffer Full	2 CR

NOTE: When using the SERIES 1, 2 CH protocol, be careful with the transmission of binary data (control codes, bit images, etc.) since the printer discards poll characters.

Serial Parameters (RS-232 And RS-422)

Baud Rate

Values: 110 to 256,000.

9600 is the default.

This parameter must be set to match your host computer.

Baud rate is the number of bits, including control bits (start/stop and parity bits) transferred per second over the interface.

Data Bits

Values: 5 to 8 (default).

This parameter must be set to match your host computer.

Serial interfaces support 5, 6, 7, and 8-bit transfer of data words.

Most use 8-bit data transfer, but this must match the host computer.

Stop Bits

Values: 1(default) or 2.

This parameter must be set to match your host computer.

Stop bits signal the end of a transferred serial data word.

Parity

Values: None (default), 0, 1, Even, or Odd.

This parameter must be set to match your host computer.

The host may send a parity bit with every data word. The parity bit is used for error checking.

DTR (Data Terminal Ready) Function

Values: On/Offline&Buf (default), True, False or On/Offline.

This parameter must be set to match your host computer.

The DTR Function parameter is part of hardware flow control. This parameter determines when the printer generates the Data Terminal Ready (DTR) signal to the host computer.

DTR is a status signal that the printer sends to the host to indicate whether or not the printer is ready to receive data.

- The True parameter setting causes the printer to continuously assert the DTR signal.

Chapter 3 Printer Configuration

- The False setting causes the printer to never assert the DTR signal.
- The On/Offline&Buf setting (the default setting) causes the printer to assert the DTR signal only when the printer is online and its internal serial buffer is not full.
- The On/Offline setting causes the printer to assert the DTR signal whenever either the printer is offline or its internal serial buffer is full.

RTS (Request To Send) Function

Values: On/Offline&Buf (default), True, False or On/Offline.
This parameter must be set to match your host computer.

The RTS Function parameter is part of hardware flow control. This parameter determines when the printer generates the Request to Send (RTS) signal to the host computer. RTS is a status signal that the printer sends to the host to indicate whether or not the printer is ready to receive data.

- The True parameter setting causes the printer to assert continuously the RTS signal.
- The False setting causes the printer to never assert the RTS signal.
- The On/Offline&Buf setting (the default setting) causes the printer to assert the RTS signal only when the printer is online and its internal serial buffer is not full.
- The On/Offline setting causes the printer to assert the RTS signal whenever either the printer is offline or its internal serial buffer is full.

DTR Polarity

Values: Normal (default) or Inverted.

This parameter must be set to match the DTR signal polarity of your host computer.

This parameter enables the DTR signal to invert if required for a particular installation.

Serial Parameters (RS-232 And RS-422)

RTS Polarity

Values: Normal (default) or Inverted.

This parameter must be set to match the RTS signal polarity of your host computer.

This parameter enables the RTS signal to invert if required for a particular installation.

Buffer Size

Value: 8192 bytes.

This parameter reflects the size in characters of the printer's data buffer.

This parameter cannot be changed in the current release of the emulation software. However, it might be changeable in a future release.

Number (Of) Buffers

Value: 2.

This parameter reflects the number of data buffers in the printer's memory.

This parameter cannot be changed in the current release of the emulation software. However, it might be changeable in a future release.

FIFO Trigger

Values: None, 1, 4, 8, or 14 (default).

You can specify how many bytes the First In, First Out (FIFO) input buffer stores before the bytes are sent to the printer's data buffer.

Diagnostic

Values: None (default), Transmit, or Loopback.

This parameter provides for testing of the serial interface circuits. Tests include a data transmission test and a serial loopback test (which requires a loopback plug).

Series 1 Poll

Values: The allowable range is 0 through 255. The default value for this parameter is 0.

This parameter selects the character that the printer recognizes as the Series 1 poll character.

NOTE: This parameter is used only with the SERIES 1, 1 CH and SERIES 1, 2 CH protocols. See the description of the Host Protocol menu option on page 75 for more information.

Series 1 Delay

Values: 0+ Msec, 15+ Msec, or 30+ Msec. The default value for this parameter is 0+ Msec.

This parameter selects the Series 1 delay time, in milliseconds, that the printer waits prior to sending the Series 1 response to the host.

NOTE: This parameter is used only with the SERIES 1, 1 CH and SERIES 1, 2 CH protocols. See the description of the Host Protocol menu option on page 75 for more information.

Series 1 Idle

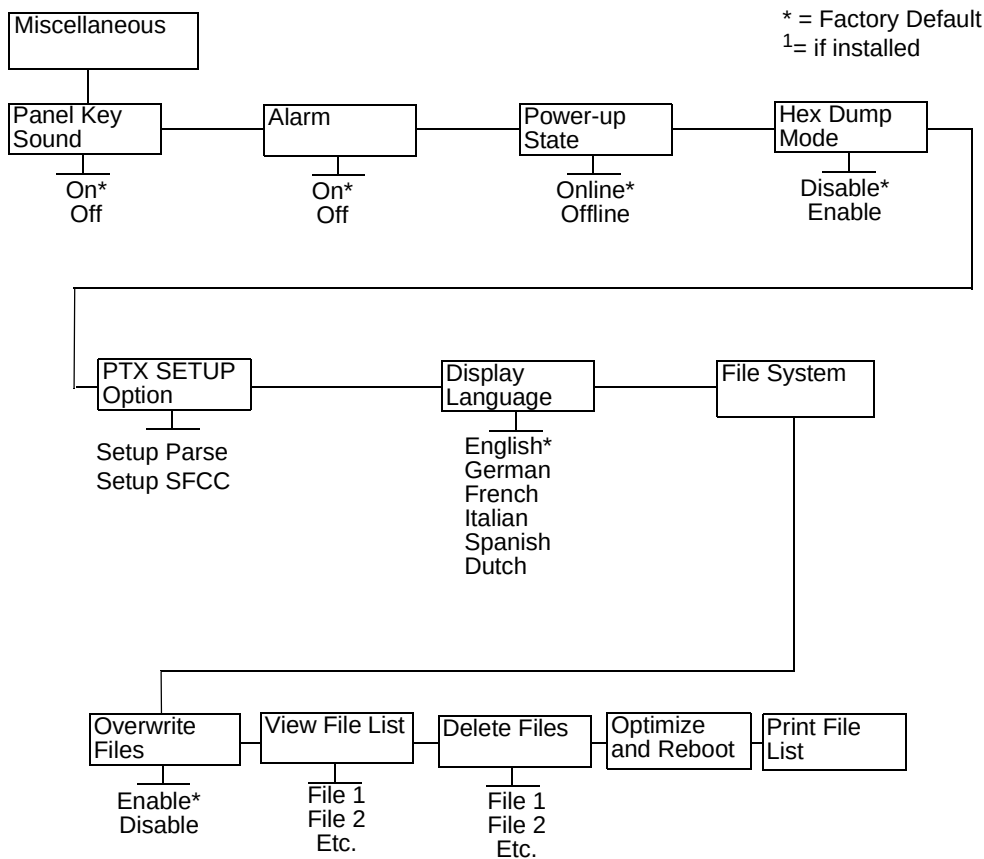
Values: Enable or Disable. The default value for this parameter is Disable.

If you enable the Series 1 Idle parameter, then whenever the buffer is less than 75% full, the printer sends a response character to the host every two seconds.

NOTE: This parameter is used only with the SERIES 1, 1 CH and SERIES 1, 2 CH protocols. See the description of the Host Protocol menu option on page 74 for more information.

Miscellaneous Menu

Miscellaneous Menu



Panel Key Sound

Panel key sound allows you to configure the printer to beep when you press a key (switch). The default setting is On.

Alarm

Alarm allows you to configure the printer to beep when a printer fault condition occurs. The default setting is On.

Power-up State

Power-up state allows you to configure the printer to power up in the offline or online state. The default setting is Online.

Hex Dump Mode

Hex dump mode allows you to place the printer into the “hex dump” mode, in which the printer outputs a hexadecimal data stream. The purpose of hex dump mode is to see exactly what data is received by the printer, in order to debug forms, for example.

When enabled, the hex dump mode translates all host interface data to its hexadecimal equivalent, then prints the hex code and its printable symbol, if one exists. Figure 8 shows a partial example of a hex dump.

After the printer enters hex dump mode, all characters it prints (including any in the printer's input buffer) are printed in two forms: as a two-symbol hexadecimal code, and as the character's printable symbol (if it has one). A nonprintable code is printed as a period [.] symbol. Up to 16 characters can be printed per line of hex dump printout. While the printer is in hex dump mode, it does not act upon any control codes, other than to print their hexadecimal equivalents.

The 16 characters printed per line on the hex dump are formatted so that the 16 printable symbols are printed in columns 1 through 16. The 17th column is blank. Column 18 contains either a “p” (PI line active) or a blank (PI not active). Columns 19 and 20 contain the hexadecimal code for the first character, followed by a blank. The PI line condition and hexadecimal code for the second character are printed in columns 22, 23, and 24, followed by a blank. The third through 16th characters are printed in a similar manner. The hexadecimal code for the 16th character is printed in columns 78, 79, and 80.

Subsequent printing observes the current setting for skip-over perforation, form length, and top-of-form position parameters.

Miscellaneous Menu

If a fault occurs while printing a hex dump, the printer reverts to the normal fault state. When the fault is cleared, the printer resumes printing the hex dump (either a partial line with a form feed, or nothing at all). Top-of-form remains unaffected.

.The Impact Prin	09	54	68	65	20	49	6D	70	61	63	74	20	50	72	69	6E
ter Emulation pr	74	65	72	20	45	6D	75	6C	61	74	69	6F	6E	20	70	72
ints in one-up,.	69	6E	74	73	20	69	6E	20	6F	6E	65	2D	75	70	2C	0A
.two-up, and fou	09	74	77	6F	2D	75	70	2C	20	61	6E	64	20	66	6F	75
r up page window	72	20	75	70	20	70	61	67	65	20	77	69	6E	64	6F	77
s....	73	2E	0C	0D	0A											

Figure 8. Sample Hex Dump

To begin a hex dump, first place the printer offline and enable the Hex Dump Mode option from the control panel. Next, place the printer online. Finally, send data to the printer from the host computer. Any data received from the host is “dumped” to the printout.

To cancel a hex dump, first place the printer offline. Then, disable the Hex Dump Mode option from the control panel. The paper then may be advanced to the next top-of-form.

PTX SETUP Option

The PTX SETUP Option menu selection has two submenu selections: Setup Parse and Setup SFCC.

Setup Parse

Setup Parse allows you to enable or disable PTX SETUP processing. If Setup Parse is disabled, the printer prints PTX SETUP commands as regular text. The default setting is Disabled.

Setup SFCC

Setup SFCC sets the Special Function Control Code (SFCC) for the PTX SETUP functions. The default setting is decimal 33. (! Character)

Display Language

Display Language allows you to select the language used for control panel messages and configuration printouts. The available choices are English, German, French, Italian, Spanish, or Dutch. The default setting is English.

File System

Overwrite

Allows you to prevent files from being overwritten by disabling the overwrite function.

View Files

Displays the list of files in the file system. Pressing the DOWN key displays the file size.

Delete Files

Displays the list of all files in the file system. Pressing the ENTER key deletes the file displayed on the front panel.

Optimize And Reboot

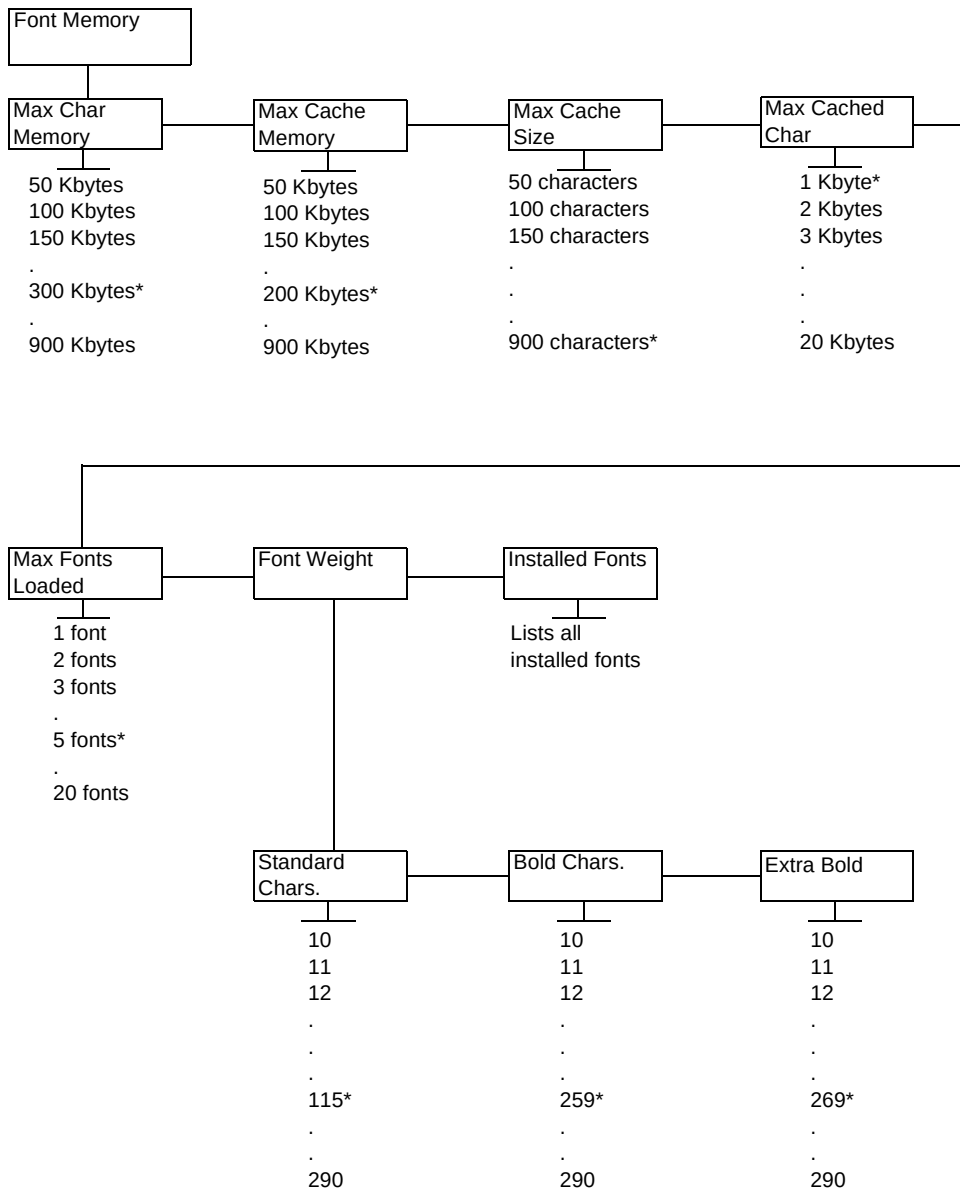
Reclaims flash memory space from deleted flash files. After pressing ENTER, wait for the printer to reboot.

Print File List

Prints a summary of the files stored in flash memory and several statistics on File System Usage.

Font Memory Menu (Not In PCL 5 Emulation)

Font Memory Menu (Not In PCL 5 Emulation)



Chapter 3 Printer Configuration

NOTE: For most applications, the default settings for font memory are acceptable. Therefore, do not change the defaults unless your application requires an uncommon font memory configuration.

Activating Font Memory Options

After selecting any of the “Font Memory” options, perform the following steps to activate the new value:

1. Save your configuration changes. See the Config. Control menu option “Save Configuration” on page 63.
2. Change the power-up configuration to match the configuration you just saved. See the Config. Control menu option “Power-up Configuration” on page 64.
3. Turn the printer power off and then on again.

Max Char Memory

The Maximum Character Memory option specifies the size of the largest character that can be printed. To calculate the memory requirement, use this equation:

$$\frac{\text{horizontal resolution} \times \text{vertical resolution} \times \text{character height (inches)} \times \text{character width (inches)}}{8}$$

For example, if an application requires a character that is 7 inches high by 4 inches wide, calculate the Maximum Character Memory value as follows:

$$\frac{300 \times 300 \times 7 \times 4}{8} = 315,000$$

Therefore, select a value that is equal to or greater than 315,000. The closest available value is 350 KBytes.

The allowable range is 50 KBytes to 900 KBytes, in 50-KByte increments. The default value for this parameter is 300 KBytes.

Font Memory Menu (Not In PCL 5 Emulation)

Max Cache Memory

The Maximum Cache Memory option specifies the size of the memory block that can be allocated to the font cache. The font cache stores bitmaps that are created on demand from the font outlines stored in Flash memory. The cache allows the printer to print scalable fonts at optimum speed.

To calculate the memory requirement, use this equation:

$$\frac{\text{horizontal resolution} \times \text{vertical resolution} \times \text{average character height (inches)} \times \text{average character width (inches)} \times \text{\# of characters to be cached}}{8}$$

The allowable range is 50 KBytes to 900 KBytes, in 50-KByte increments. The default value for this parameter is 200 KBytes.

Max Cache Size

The Maximum Cache Size option specifies the maximum number of characters that can be stored in the font cache.

The allowable range is 50 to 900 characters, in 50-character increments. The default value for this parameter is 900 characters.

Max Cached Char

The Maximum Cached Characters option specifies the size of the largest character that can be stored in the font cache. To calculate the memory requirement, use this equation:

$$\frac{\text{horizontal resolution} \times \text{vertical resolution} \times \text{character height (inches)} \times \text{character width (inches)}}{8}$$

For example, if an application requires the use of a character that is 1 inch high by 1 inch wide, calculate the Maximum Cached Characters value as follows:

$$\frac{300 \times 300 \times 1 \times 1}{8} = 11,250$$

Therefore, select a value that is equal to or greater than 11,250. The closest available value is 12 KBytes.

Chapter 3 Printer Configuration

The allowable range is 1 KBytes to 20 KBytes, in 1-KByte increments. The default value for this parameter is 1 KBytes.

Max Fonts Loaded

The Maximum Fonts Loaded option specifies the number of scalable font outlines that can be concurrently loaded into RAM in the printer.

The allowable range is 1 to 20 fonts, in 1-font increments. The default value for this parameter is 5 fonts.

NOTE: The above calculations for Maximum Character Memory, Maximum Cache Memory, and Maximum Cached Characters assume the standard 300 dpi resolution. If the optional 240 or 400 dpi resolutions are used, the memory sizes must be recalculated.

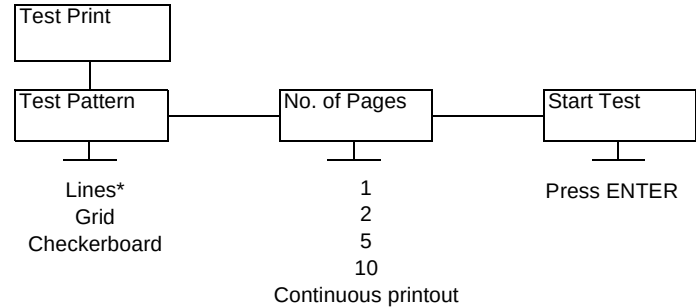
Font Weight

The Font Weight option specifies the thickness or stroke weight of the text fonts. The allowable range is 10 to 290, in increments of 1. The default values define the stroke weight for Standard, Bold, and Extra Bold printing.

Installed Fonts

The Installed Fonts option provides a list of all fonts currently loaded into RAM.

Test Print Menu



The Test print menu defines and activates a test printout. You must specify the test pattern and the number of pages to be printed.

Test Pattern

The Test Pattern option selects the type of pattern to be used for the test printout. You may select a Lines test pattern, a Grid test pattern, or a Checkerboard test pattern. The Lines test pattern is the default.

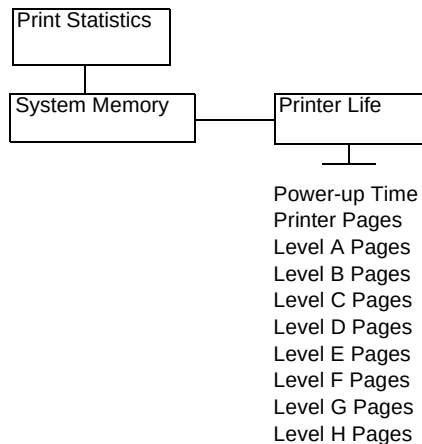
Number of Pages

The Number of Pages option selects the number of pages for the test printout. You may select 1, 2, 5, 10 pages, or a continuous printout. The default is 1 page.

Start Test

When this menu option is displayed, press ENTER to start the test printout. (This is identical to pressing the TEST key on the control panel.) To stop a continuous test print, press ENTER when this option is displayed, or press TEST. Note that the printer may output an additional ten pages before the continuous test print stops.

Print Statistics Menu



The Print Statistics menu provides access to information about memory capacity and printer usage.

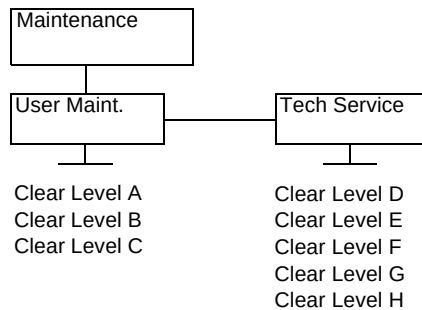
System Memory

The L5000 series printers have 32 MB of RAM (Random Access Memory), and 8 MB of Flash Memory. This is standard with all new printer shipments, and all upgraded printers. The 32 MB of RAM exceeds the amount previously specified for optimal speed for all currently available system configurations.

Printer Life

Printer Life displays the total number of hours that the printer has been powered up, the total number of pages that have been printed by the print engine, and the total number of pages that have been printed for each of the service levels. The displayed page count reflects A4-size paper (11.7 inches, normalized) and does not match the actual page count if other paper sizes are used.

Maintenance Menu



The Maintenance menu provides access to information about service levels for end-users and service technicians.

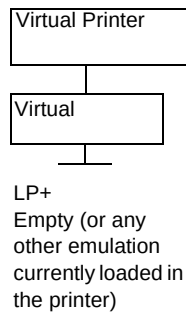
User Maint.

The User Maintenance option resets the service level page count after you complete preventive maintenance (levels A, B, and C). See Chapter 5, “Scheduled Maintenance,” for additional information.

Tech Service

The Technician Service option resets the service level page count after preventive maintenance is completed by a service technician (levels D, E, F, G, and H). See Chapter 5, “Scheduled Maintenance,” for additional information.

Virtual Printer Menu



The Virtual Printer menu allows the user to select which emulation they want to use that is currently loaded in flash memory.

Virtual Printer

The Virtual Printer option allows the user to select which emulation, or partition, the printer should switch to using. If the user selects Empty, the printer automatically enters download mode. If the user selects an emulation and then manually enters download mode, the position selected will be the position for the new emulation to be loaded. If you want to download a new emulation into the printer's flash memory, follow the procedures in the Loading Flash Memory section, starting on page 93.

Loading Flash Memory (If Equipped)

Printer emulation and operating system software are loaded into flash memory at the factory, but you will install software or files in the following situations:

- The customer buys the PGL or VGL graphics, Expansion-CT, or IPDS option after the printer is installed
- The customer needs to upgrade printer software
- The customer needs different emulation software
- You have replaced the controller board
- You have added or replaced the flash memory card
- The customer needs to load logos, forms, TIFF files, setup files, and/or font files to the printer

Emulation software and fonts are supplied on one or more 3.5 inch, double-density diskettes. Each emulation file is “executable,” which means you can expand it and copy it into the printer’s flash memory with a single command. The other kinds of files are not executable; however, before they can be downloaded, you might need to convert them into downloadable format. You can then copy them to the printer’s flash memory as binary data files, as instructed later in this section.

NOTE: The procedures that follow assume that you have some familiarity with DOS file commands.

The lasr2fls Utility Program

The `lasr2fls` program is a DOS utility that is supplied with the flash software on diskette. This utility converts logo, form, TIFF, setup, and font files into downloadable format.

To convert files into downloadable format, do the following:

1. Create a directory on the hard drive and copy the `lasr2fls` utility to that directory.
2. Copy all of the files to be converted to the directory where the `lasr2fls` utility resides.
3. Change to the drive and directory where the `lasr2fls` utility resides.
4. To display a brief help message, at the DOS prompt, enter the command name `lasr2fls` with no parameters:

`lasr2fls <Return>`

You will then see a help message similar to the following:

```
L50XX Laser Printer Flash File Conversion Utility, Vx.xx, mm/dd/yy
```

```
USAGE:
```

```
lasr2fls file_name1 file_name2 file_name3 A <return>
```

```
or
```

```
lasr2fls file_name1 file_name2 file_name3 A FONT <return>
```

```
file_name1: Input file name to be converted from.
```

```
file_name2: Output file name for file download.
```

```
file_name3: Flash file name to be stored in file system after download.
```

```
hw_type: Specify A all the time.
```

```
FONT: Optional, specify FONT if this is a font file.
```

Loading Flash Memory (If Equipped)

- The first file name following the command name is the name of the input file that you want to convert.
- The second file name is the name of the downloadable output file, which the utility will create.
- The third file name is the name of the output file as it will be stored in the flash memory after downloading and later displayed on the printer LCD menus.
- The “A” parameter in the command line is a fixed parameter that must always be entered.
- If the file being converted is a font file, enter “FONT” following the “A” parameter on the command line. If the file is not a font file, omit “FONT.”

IMPORTANT Be sure that you always enter the “A” parameter on the `lasr2fls` command line, as indicated above.

When the `lasr2fls` utility runs, it reads the file named *file_name1* and creates the file named *file_name2*. The file named *file_name2* is a flash downloadable file that can be copied and downloaded to the printer, as detailed later in this section. The utility takes the filename you specify for *file_name3* and stores this information within the downloadable output file (*file_name2*). The *file_name3* file name is used only to determine the file name to display on the printer front panel menus.

IMPORTANT To make disk-based and flash-based emulations compatible with one another, the first and third file names in the command line must be the same.

5. To convert a font file, enter the following at the DOS prompt on the computer, for example:

```
lasr2fls custom.sf custom.dwn custom.sf A FONT  
<Return>
```

where *custom.sf* is the name of one of the font files you want to convert. This command converts the specified font file, creating the downloadable file *custom.dwn*.

6. Repeat step 5 for any additional font files to be converted.

Chapter 3 Downloading Into Flash Memory

7. To convert a setup file, enter the following at the DOS prompt, for example:

```
lasr2fls setup.ptx setup.dwn setup.ptx A  
<Return>
```

where *setup.ptx* is the name of one of the setup files you want to convert. This command converts the specified setup file, creating the downloadable file *setup.dwn*.

8. Repeat step 7 for any additional setup files to be converted.
9. To convert other kinds of files (a logo or form file, for example), enter the following at the DOS prompt, for example:

```
lasr2fls my_logo.xxx my_logo.dwn my_logo.xxx A  
<Return>
```

where *my_logo.xxx* is the name of one of the form or logo files you want to convert. This command converts the specified logo or form file, creating the downloadable file *my_logo.dwn*.

10. Repeat step 9 for any additional logo and form files to be converted.
11. Proceed to the next section to download the converted files.

IMPORTANT Be sure that you always enter the “A” parameter on the **lasr2fls** command line, as indicated above.

Downloading Into Flash Memory

CAUTION When downloading an emulation to a virtual printer, all other optional font files, customer-supplied logos, and setup files will be erased. You will then need to reload these files. Before starting a download procedure, be sure that you have all of the necessary installation files on hand.

To download emulation software, as well as downloadable files for logos, forms, TIFF, setup, and fonts to the printer, do the following:

Loading Flash Memory (If Equipped)

1. If you plan to download any logo, form, TIFF, setup, or font files into the printer, you must first use the supplied `laser2fls` DOS utility program to convert these files into downloadable format. See page 94. (Emulation files require no conversion.)
2. Take the printer offline by pressing the **ONLINE** key.
3. Make a printout of *all* saved configurations for the currently-selected virtual printer. (Installing new software erases all saved configurations. You will use the printouts later to restore the printer configuration.)

NOTE: Loading flash memory does not affect the page count or other data stored in NVRAM.

4. Switch to the other virtual printer and press the **ENTER** key on the printer control panel. (For information on switching virtual printers, see page 92.

NOTE: Switching virtual printers is also known as selecting a flash memory partition.

5. Wait until the printer has completely switched to the virtual printer you selected.
6. Make a printout of *all* saved configurations for the currently-selected virtual printer. (You will use the printouts later to restore the printer configuration.)
7. Set the printer power switch to O (off).
8. If the printer is already connected to the parallel port of an IBM-compatible computer that is using the PC-DOS™ or MS-DOS® operating system, skip to step 14. If not, continue with step 9.
9. Unplug the printer AC power plug from its electrical outlet.
10. Disconnect all data input cables from the printer interface.
11. Connect a parallel data cable to the default parallel port (LPT1) of an IBM-compatible computer that is using the PC-DOS or MS-DOS operating system.

NOTE: You can connect the cable to the LPT2 port if the LPT1 port is already in use. If you use the LPT2 port, the download command is different, as described in the note after step 37.

12. Connect the parallel data cable to the parallel port of the printer.

Chapter 3 Downloading Into Flash Memory

13. Plug the printer AC power plug into its electrical outlet.
14. Power on the computer.
15. Set the printer power switch to | (on).
16. If you have no emulation software to install and you are installing only logo, form, TIFF, setup, or font files, skip to step 43. If you do have emulation software to install, continue with step 17.
17. Switch to the virtual printer where you want to download the new emulation software (also known as selecting the flash memory partition) and press the **ENTER** key on the printer control panel.
18. Set the printer power switch to O (off).
19. If the emulation you are installing is supplied on a single diskette, skip to step 32. If the emulation is supplied on two or more diskettes, you must first recombine the multiple files from the diskettes into one file on your computer's hard drive; continue with step 20.
20. Create a directory on your computer hard drive where you will store the recombined files from the emulation diskettes by typing the following at the DOS prompt:

MD DOWNLOAD <Return>

21. Make the newly-created directory the "active" directory by typing the following at the DOS prompt:

CD DOWNLOAD <Return>

22. Insert the *last* emulation diskette in the series (e.g., 2 of 2, 3 of 3, etc.) into diskette drive A (or B) of the computer.
23. Get the name of the compressed emulation file on the diskette by typing the following at the DOS prompt:

DIR A: <Return>

(If the diskette is in drive B, type **B: <Return>**)

The file name of the compressed file on the diskette takes the form *part_num.zip*, for example 123456.zip.

Loading Flash Memory (If Equipped)

24. At the DOS prompt type:

A:\PKUNZIP A:\part_num

where *part_num* is the six digit number you noted in the previous step.

(Replace **A:** with **B:** if you are using the B drive.)

25. The PKUNZIP® program will execute, and the following message will appear on the computer screen:

Insert disk #1 - Press a key when ready

26. Remove the diskette in the disk drive and insert the diskette labeled

Disk 1 of 2 (or 1 of 3, etc.)

27. Press the <Return> key on the computer. After the file is expanded to the hard drive, the following message will appear on the computer screen:

Insert disk #2 - Press a key when ready

28. Remove the diskette in the disk drive and insert the diskette labeled

Disk 2 of 2 (or 2 of 3, etc.)

29. Press the <Return> key on the computer. If there are only two diskettes for the emulation, you will be returned to the DOS prompt when the expansion is complete. If there are more than two diskettes, you will be asked to insert disk #3 and press a key. Continue in this manner until you have inserted all of the emulation diskettes and the DOS prompt has returned.

Chapter 3 Downloading Into Flash Memory

30. Type the following at the DOS prompt:

DIR <Return>

You will see a directory listing containing the file ***part_num.exe***, where the filename is the six digit number (e.g., 123456.zip) you noted above. Write down the complete name of the file with the .exe extension. **This is the file you will download into the printer.**

31. Skip to step 35.
32. Insert the emulation diskette into diskette drive A (or B) of the computer.
33. Make the diskette drive the active drive by typing the following at the DOS prompt:

A: <Return>

(If the diskette is in drive B, type **B: <Return>**)

34. Get the name of the emulation file on the diskette by listing the contents of the diskette; at the DOS prompt type:

DIR <Return>

The file name of the emulation file on the diskette takes the form ***part_num.exe***, for example 123456.exe. Write down the complete name of the file with the .exe extension. **This is the file you will download into the printer.**

35. On the printer control panel, press and hold down the **ONLINE + PAGE EJECT** keys. Without releasing the keys, power the printer on. Continue holding the **ONLINE** and **PAGE EJECT** keys down.
36. When you see "WAITING FOR FILE DOWNLOAD" on the LCD, release the **ONLINE** and **PAGE EJECT** keys.

Loading Flash Memory (If Equipped)

37. At the DOS prompt on the computer type, for example:

123456.exe -pb <Return>

where 123456.exe is the emulation file you noted in step 30 (for an emulation on multiple diskettes) or in step 34 (for an emulation on a single diskette). This command expands the emulation file, then copies it as a binary file into the flash memory in the printer.

NOTE: If you are downloading the file using the LPT2 port on the computer, enter the following DOS command, for example:

123456.exe -pb2 <Return>

38. If there is an existing emulation in the selected virtual printer, you will be asked to confirm the erasure of the existing emulation. The message on the printer LCD will be similar to the following:

CLEAR PGL?
PRESS ENTER

To confirm the erasure, press the **ENTER** key on the printer control panel. Otherwise, press the **CANCEL** key on the control panel to abort the operation; the printer will then reboot.

39. While the file is being copied into memory, the printer LCD informs you of the load process and status. (Messages are listed in table following this section.)
40. Wait until the new program has successfully loaded into printer memory.
41. If you have another emulation to install, go back to step 17.
42. If you have any additional software to install (logo, form, TIFF, setup, or font files), continue with step 43. If you have no additional software to install, skip to step 55.
43. Switch to the virtual printer where you want to download the new software (also known as selecting the flash memory partition) and press the **ENTER** key on the printer control panel.
44. Set the printer power switch to O (off).

Chapter 3 Downloading Into Flash Memory

45. On the printer control panel, press and hold down the **ONLINE + PAGE EJECT** keys. Without releasing the keys, power the printer on. Continue holding the **ONLINE** and **PAGE EJECT** keys down.
46. When you see "WAITING FOR FILE DOWNLOAD" on the LCD, release the **ONLINE** and **PAGE EJECT** keys.
47. If the software to be installed is already on the hard drive, change to the drive and directory where the software resides, then skip to step 50. If the software to be installed is on diskette, continue with step 48.
48. Insert the diskette containing the software to be installed into diskette drive A (or B) of the computer.
49. Make the diskette drive the active drive by typing the following at the DOS prompt:

A: <Return>

(If the diskette is in drive B, type **B: <Return>**)

50. Get the names of all of the logo, form, TIFF, setup, and font files that you want to download from the diskette by listing the contents of the directory; at the DOS prompt type:

DIR <Return>

The downloadable files in the directory take the form
file_name.dwn

Write down the complete name of each file with the .dwn extension.

Loading Flash Memory (If Equipped)

51. Download the files to the printer by using the DOS copy command. You can download the files one at a time by entering one file name per DOS copy command. Alternatively, you can copy multiple files in one copy command.

To download one file at a time, enter the following at the DOS prompt, for example:

```
copy /b file_name.dwn LPT1 <Return>
```

To download multiple files, enter the following at the DOS prompt, for example:

```
copy /b file_name1.dwn+file_name2.dwn+... LPT1  
<Return>
```

NOTE: The above command examples assume that LPT1 is used as the download port from the computer, and that the printer is already in download mode, waiting for file download, before you copy the files to the printer. If you are downloading the files using the LPT2 port on the computer, substitute "LPT2" for "LPT1" in the above commands.

52. While the files are being copied into memory, the printer LCD informs you of the load process and status. (Messages are listed in the table following this section.)
53. Wait until the new files have successfully loaded into printer memory.
54. If you have any more software to install (logo, form, TIFF, setup, or font files), go back to step 43.
55. When all of the new software has successfully loaded into memory and the printer has reset itself, set the printer power switch to O (off).
56. Remove the diskette(s) from the computer and store them with the printer.
57. If you had to install a parallel data cable to the computer and printer in step 11, continue with step 58. If not, skip to step 63.
58. Unplug the printer AC power plug from its electrical outlet.
59. Power off the computer.

Chapter 3 Downloading Into Flash Memory

60. Disconnect the parallel data cable from the computer and from the printer.
61. Reconnect the customer's data input cable(s) to the printer, if required.
62. Plug the printer AC power plug into its electrical outlet.
63. Set the printer power switch to | (on).
64. Using the configuration printouts you made in step 3 and step 6, restore the printer configuration(s). (Refer to page 53.)

Loading Flash Memory (If Equipped)

Table 1. Flash Messages

Error Code	Message	Explanation
H2	Waiting For File Download	The system is now ready for the emulation or file download.
H3	Loading File From Port xxx%	The system is currently downloading the emulation or file.
H4	Clear Flash Please Wait...	The printer is erasing the selected flash memory partition (the selected emulation).
H5	Write File <i>filename.ext</i>	The system is saving the file to flash.
H8	Clear xxxx? Press Enter	Confirm erasure of the current emulation, flash memory partition. xxxx is the name of the current emulation.
H9	Clear Flash? Press Enter	The system is confirming the erasing of the entire contents of the flash memory. Press ENTER for Yes, or CANCEL to abort.
K0	DC NOT 1ST FILE	The emulation file is not the first file sent to the printer for emulation installation. Make sure the emulation file is sent to the printer first for installation.
K1	FILE NOT COMPATIBLE	The printer detects the wrong file type for emulation download. Make sure the file is correct for the printer type.
K2	WRONG FILE CHECKSUM	The printer detected emulation or file corruption during download or emulation bootup. Re-install the emulation or re-download the flash files.

Chapter 3 Downloading Into Flash Memory

Error Code	Message	Explanation
K3	DC PROGRAM NOT VALID	There is no emulation installed or the emulation in flash memory is corrupted. Install/re-install emulation software to the printer.
K4	NO FLASH FILE SYSTEM	The flash file system is corrupted or the flash memory is unformatted. Install/re-install emulation software to the printer.
K5	DRAM FAIL AT ADDRESS xxxxxxxx	Contact your authorized service representative.
K6	FLASH MEMORY FAIL	Contact your authorized service representative.
K7	PROGRAM FLASH FAIL AT xxxxxxxx	Contact your authorized service representative.
K8	FLASH MEMORY FAIL	There is not enough flash memory space for the emulation or file download. Initiate the flash file system optimization.
K9	PROGRAM NEEDS MORE DRAM	Make sure DRAM devices are all detected by the system. Contact your authorized service representative.

4

Consumables Replacement

Consumables Replacement

For the best print quality, always use genuine Printronix supplies.
Part numbers are provided below.

For the name of your nearest Printronix full service distributor,
please call:

United States (800) 733-1900 or (714) 368-2300

Europe (33) 1-46-25-1900

Singapore (65) 548-4116

Due to differing replacement intervals, each of the following
replacement procedures is written as a complete, separate task.

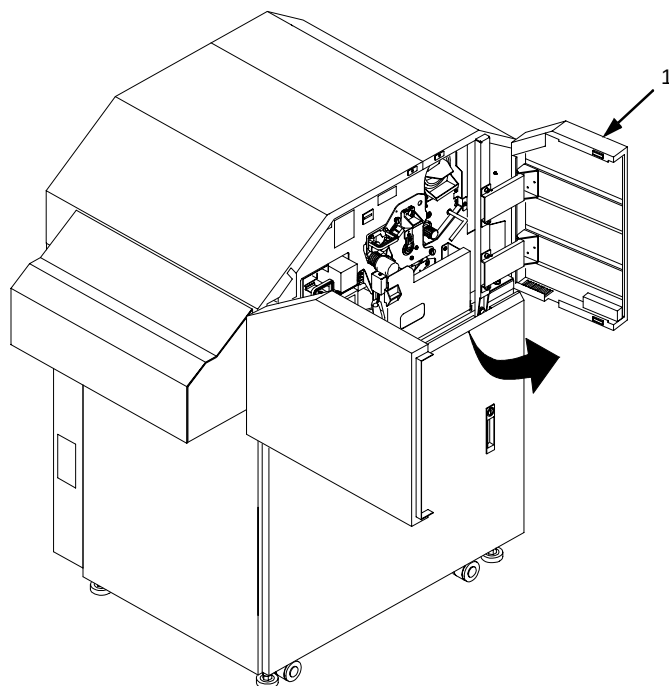
For the best print quality, replace the printer consumables at the
intervals specified below. The yield of the supplies is based on a
4% coverage of letter size (8.5 inch x 11 inch) paper. However, the
yield may vary according to your print applications, environmental
conditions, and toner density setting.

Replacement Intervals

Consumable Item	Part Number	Replacement Interval (in Pages) ¹
Toner Cartridge	703532-001	21,000
Waste Toner Bottle	202984-001	150,000
Photoreceptor Drum	703535-001	150 - 300,000 See Note 2
Developer	703548-001	150,000
Developing Unit	705739-001	600,000
Note 1: Will vary with paper size, media type, and toner coverage. Note 2: Replace at 300,000 pages or sooner if print quality is no longer acceptable. Drum life is dependent upon media used and proper maintenance and operation of the printer. Print media other than bond paper (e.g. labels, card stock, plastic, or vinyl) may reduce drum life as much as 50%.		

Opening The Upper Doors

1. Take the printer offline.
2. When paper motion stops, wait 15 seconds, then open the printer upper doors.



Legend:

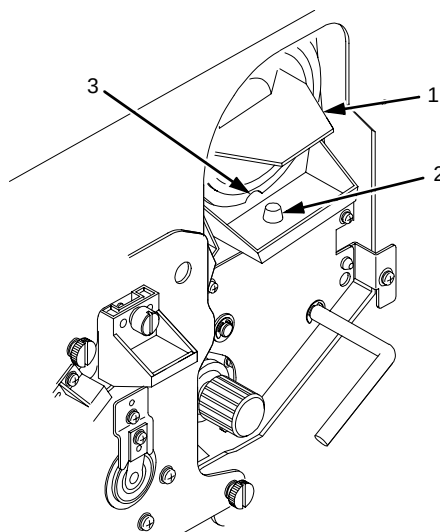
- 1) Upper Door

Replacing The Toner Cartridge

NOTE: When replacing the toner cartridge, place the old cartridge in a disposable wrapper (e.g., a plastic bag, paper towels, newspaper) to minimize toner spillage.

You can wear vinyl gloves to prevent toner from contacting the skin. If necessary, use only cold water to remove toner from skin or clothing.

3. Rotate the toner cartridge counterclockwise until the notch is aligned with the pin in the toner hopper, and remove the cartridge.



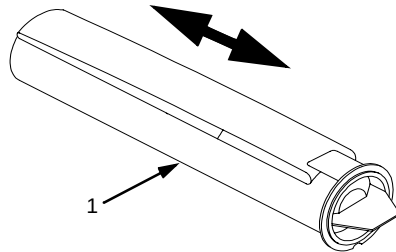
Legend:

- 1) Toner Cartridge
- 2) Positioning Pin
- 3) Notch

4. Put the old cartridge into a plastic bag and discard it.

Replacing The Toner Cartridge

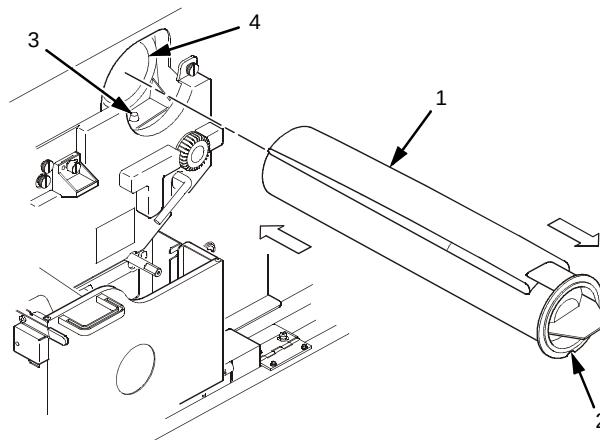
5. Keep the new toner cartridge in its package. Hold it level and shake it back and forth several times as shown. This loosens the toner in the cartridge.



Legend:

- 1) Toner Cartridge

6. Remove the new toner cartridge from its package.
7. With the cover tape facing up, insert the cartridge into the toner hopper, and slowly pull off the cover tape in the direction of the arrow. Remove the last of the tape just as the cartridge is completely inside the hopper

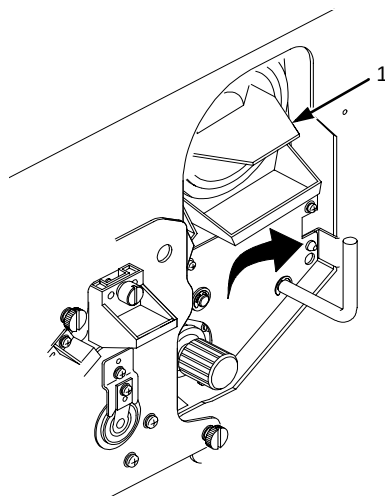


Legend:

- 1) Cover Tape
2) Notch
3) Pin
4) Toner Hopper

Chapter 4 Consumables Replacement

8. Fit the notch to the pin on the developing unit. Push the new toner cartridge as far as possible into the toner hopper.
9. Rotate the cartridge clockwise as far as it will turn.



Legend:

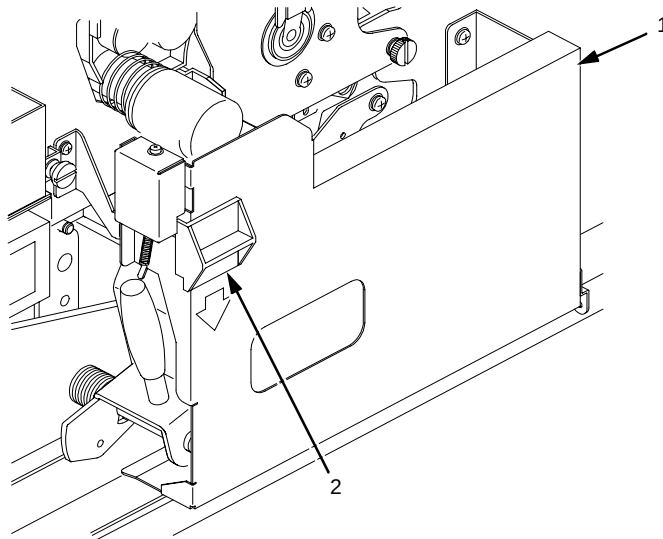
- 1) Toner Cartridge

10. If any toner has spilled, remove it with wet tissue paper or a toner vacuum.
11. Close the upper doors.

Replacing The Waste Toner Bottle

When the “WASTE TONER FULL” message appears on the control panel, replace the waste toner bottle by doing the following steps, and discard the empty bottle. Do not reuse the bottle.

1. When paper motion stops, wait 15 seconds, then open the printer upper doors. (See page 109.)
2. Open the waste toner recovery unit by pressing down on the opening lever and pulling the door toward you.

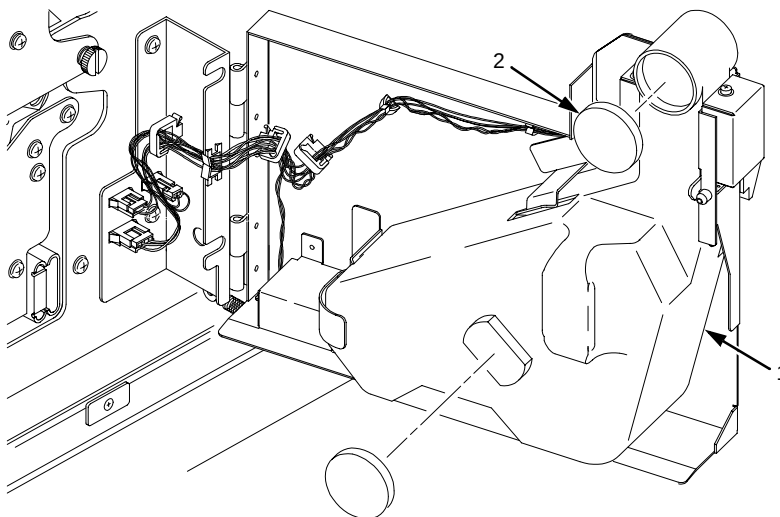


Legend:

- 1) Waste Toner Recovery Door
- 2) Opening Lever

Chapter 4 Consumables Replacement

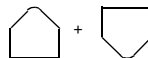
3. Remove the cap from the outside of the waste toner bottle, and cap the toner bottle.



Legend:

- 1) Waste Toner Bottle
- 2) Cap

4. Remove the waste toner bottle from the unit and discard it.
5. Install a new waste toner bottle.
6. Close the printer upper doors.
7. Clear Error 28, "WASTE TONER FULL," as follows:
 - a. Press CLEAR.
 - b. Press UP + DOWN to unlock the configuration menu.



- c. Enter the configuration menu and select the Paper Control menu.
- d. Select the "RESET TONER FULL" option and press ENTER.
- e. Exit the configuration menu.
- f. Press ONLINE.

Replacing The Photoreceptor Drum

Drum life is dependent upon media used and proper maintenance and operation of the printer. Print media other than bond paper (e.g., labels, card stock, plastic, or vinyl) may reduce drum life as much as 50%.

To replace the drum, you need a drum auxiliary rod. Please read all steps before beginning the replacement procedure.

Removal

CAUTION

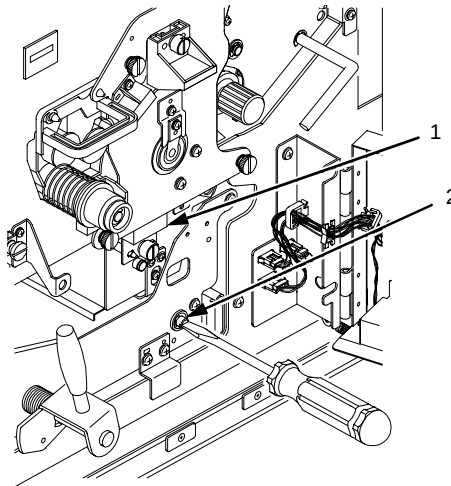
Do not do this procedure unless you have had the appropriate training. Do not do this procedure without the drum auxiliary rod (P/N 703531-170), as you may damage the drum.

1. Turn the power switch OFF.
2. Open the printer upper doors. (See page 109.)
3. Open the waste toner recovery unit. (See page 113.)
4. Remove the developing unit. (See page 123.)
5. Vacuum any spilled toner.

Chapter 4 Consumables Replacement

CAUTION The transfer charger must be in the down position to avoid scratching the drum. Failure to perform steps 6 and 7 damages the drum.

6. Rotate the transfer elevator drive shaft counterclockwise. Watch the charger movement:
 - a. If the charger starts to move up, it is already in the down position.
 - b. If the charger starts to move down, continue to rotate the drive shaft until the charger reaches the complete down position.



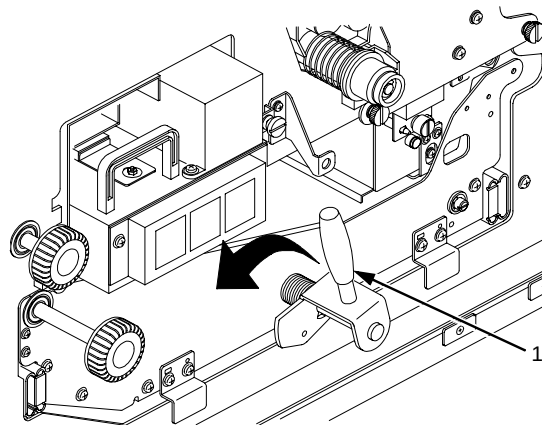
Legend:

- 1) Transfer Charger
- 2) Transfer Elevator Drive Shaft

Replacing The Photoreceptor Drum

CAUTION To avoid damaging the printer or causing false paper jams, the transport lever must be in the fully down position before closing the transport unit.

7. Lower the transport unit by turning the green lever on the transport unit to the left.

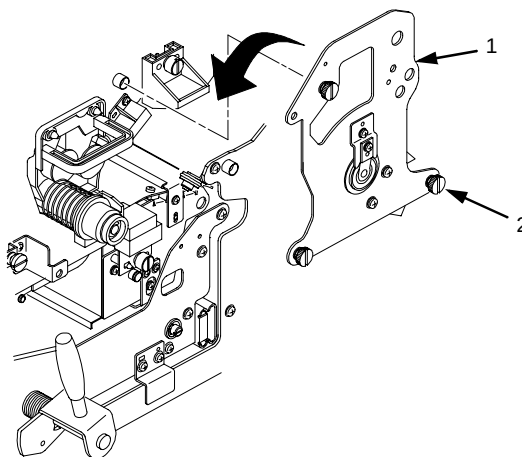


Legend:

- 1) Green Lever

Chapter 4 Consumables Replacement

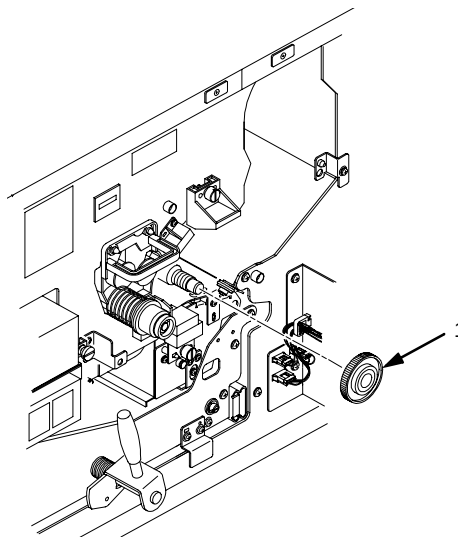
8. Loosen the three thumbscrews securing the drum plate and remove the drum plate.



Legend:

- 1) Drum Plate
- 2) Thumbscrews (3)

9. Remove the nut from the end of the drum shaft.

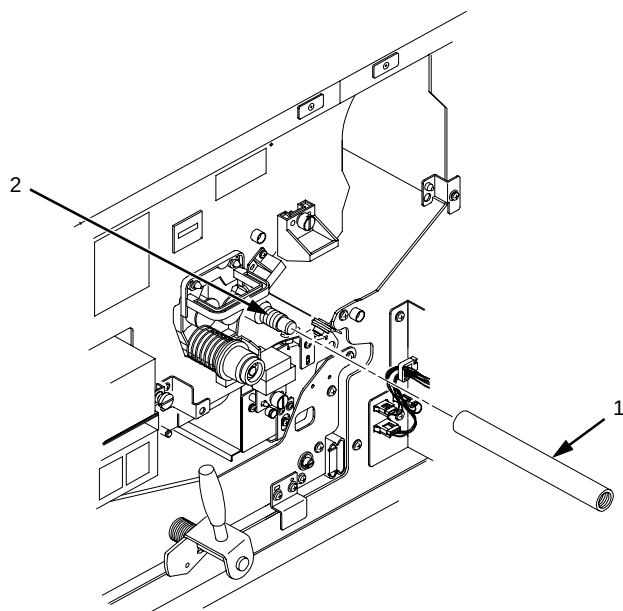


Legend:

- 1) Nut

Replacing The Photoreceptor Drum

10. Screw the drum auxiliary rod onto the drum shaft.

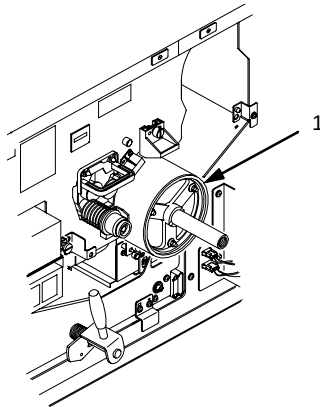


Legend:

- 1) Drum Auxiliary Rod
- 2) Drum Shaft

Chapter 4 Consumables Replacement

11. Pull the drum out along the drum auxiliary rod. Hold the front and back ends when the drum is nearly out of the printer, and remove it with both hands.



Legend:

- 1) Drum

12. Pack the old drum for shipment using the original packaging material, and close the cover of the box.
13. Wipe the drum shaft clean with a cloth.

Installation

CAUTION Avoid touching the surface of the drum with your hands. It reduces the life of the drum

1. Remove the new photoreceptor drum from its package. Do not discard the packaging material; as you need it for future drum disposal. The ends of the drum are identical; there are no front or back ends.
2. Wipe inside the endcaps of the drum with a cloth to ensure that they are clean.

Replacing The Photoreceptor Drum

CAUTION Exposing the drum to light shortens its life. Do not expose the drum to direct sunlight, and install it within five minutes under typical room lighting conditions. When removing the drum from its packaging, do not touch the surface of the drum. Fingerprints and scratches can damage the surface and cause poor print quality.

3. Using both hands, slowly slide the drum onto the drum auxiliary rod. When the drum reaches the area where the auxiliary rod connects to the drum shaft, lift the drum very gently over the connection. Let the drum rest on the rubber rollers as you gently guide it into the printer.

CAUTION The drum must rest on the rubber rollers to avoid being scratched.

4. When the drum is fully inserted into the printer, the end of the drum is slightly recessed relative to the front of the printer and the rubber guide rollers should be visible. Slightly lift the drum up off of the rubber rollers and rotate the drum by hand while applying inward pressure, until the drum moves slightly farther into the printer and locks in place.

CAUTION In order to position the drum slot and the drum shaft pin, push the drum in all the way to the back and rotate it until you feel it drop in place. Failure to lock the drum in place properly can severely damage the printer.

Never force the drum onto the shaft. If it feels as though the drum is not seating properly, remove the drum and inspect the shaft for foreign material or burrs.

5. Remove the drum auxiliary rod from the drum shaft.
6. Install the nut on the drum shaft and tighten it securely by hand.
7. Install the drum plate and tighten the thumbscrews. While installing the drum plate, hold the copper grounding clip with your thumb. Otherwise the grounding clip can be bent, making no contact with the drum shaft.

Chapter 4 Consumables Replacement

8. After installing the drum plate, visually verify good electrical contact between the copper grounding clip and the end of the drum shaft.
Alternatively, measure the resistance. Connect one lead of an ohmmeter to the bracket on the drum plate, and touch the other lead to the edge of the drum. Normal resistance should be 0Ω .
9. Install the developing unit.
10. Raise the transport unit by turning the green lever on the transport unit to the right.
11. Close the waste toner recovery unit and ensure that it latches.
12. Close the printer upper doors.

Proper Disposal Of A Drum Unit

Federal regulations prohibit inappropriate disposal of laser print drums. Dispose of used drums by shipping them to one of the following organizations:

Within U.S.A.

U.S. Fuji Electric, Inc.
240 Circle Drive N.
Piscataway, NJ 08854
Attn: Rod Storm
Phone: (732) 560-9410

Outside U.S.A.

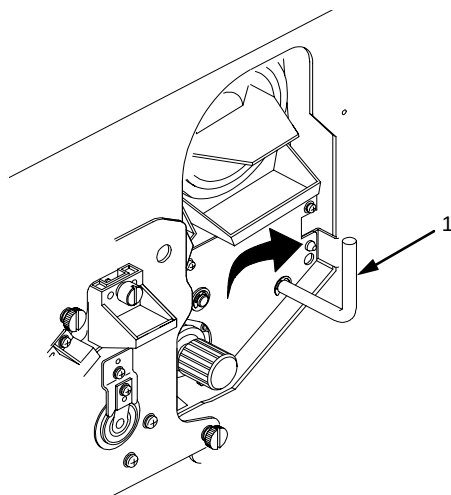
Fuji Distribution Europe B.V.
Attn: Mr. Asada
Leisteen 7,2132 ME Hoofddorp,
The Netherlands.
TEL: 20-6534790

Replacing The Developing Unit

CAUTION Do not replace the developing unit unless you have been trained to do so. Be careful not to damage the sensors while cleaning the developing unit. (If damage occurs, contact your service representative.)

Removal

1. Turn the power switch OFF.
2. Open the printer upper doors. (See page 109.)
3. Open the waste toner recovery unit. (See page 113.)
4. Rotate the developing unit lever fully clockwise so that it is pointing straight up. This separates the developing unit from the photoreceptor drum.

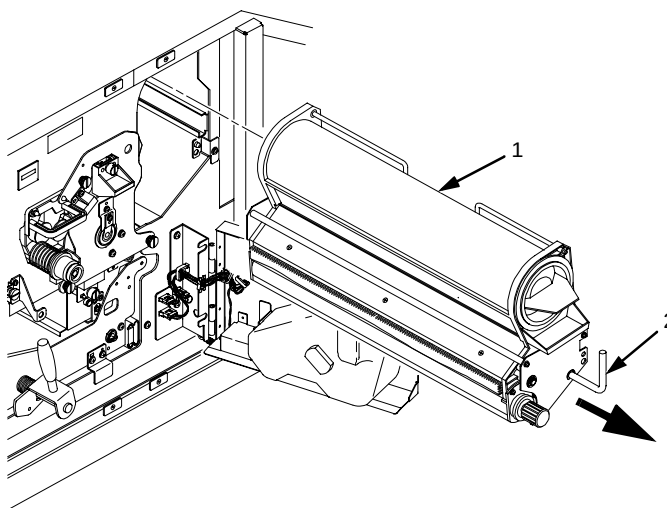


Legend:

- 1) Lever

Chapter 4 Consumables Replacement

5. Remove the developing unit by holding the lever in one hand and pulling the developing unit partially out of the printer.

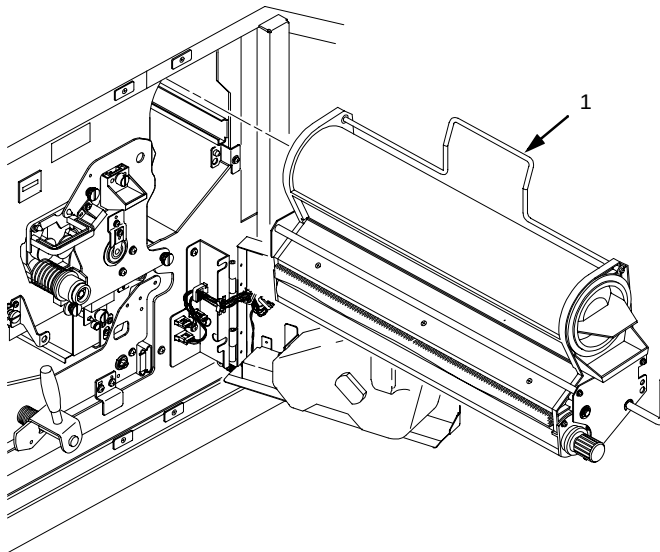


Legend:

- 1) Developing Unit
- 2) Lever

Replacing The Developing Unit

6. With your other hand, grasp the hanger and remove the developing unit from the printer.

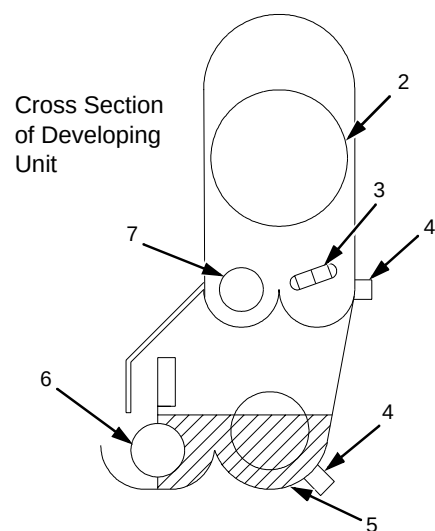
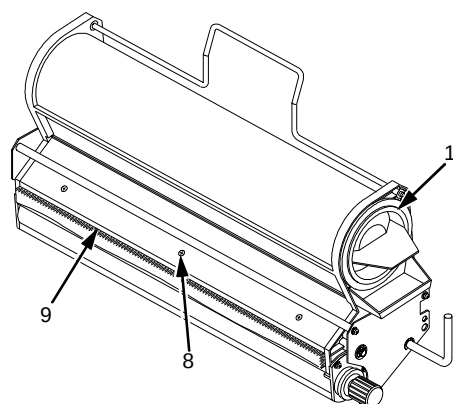


Legend:

- 1) Hanger

7. Place the old developing unit in a plastic bag and dispose of it properly.
8. Vacuum any spilled toner.
9. Remove the new developing unit from its package, and add developer to the unit. (See page 130.)

Chapter 4 Consumables Replacement



Legend:

- 1) Toner Cartridge
- 2) Developing Unit
- 3) Auger
- 4) Toner Sensor
- 5) Developing Tank
- 6) Developing Roller
- 7) Toner Supply Roller
- 8) Screws (3)
- 9) Cover

Replacing Developer

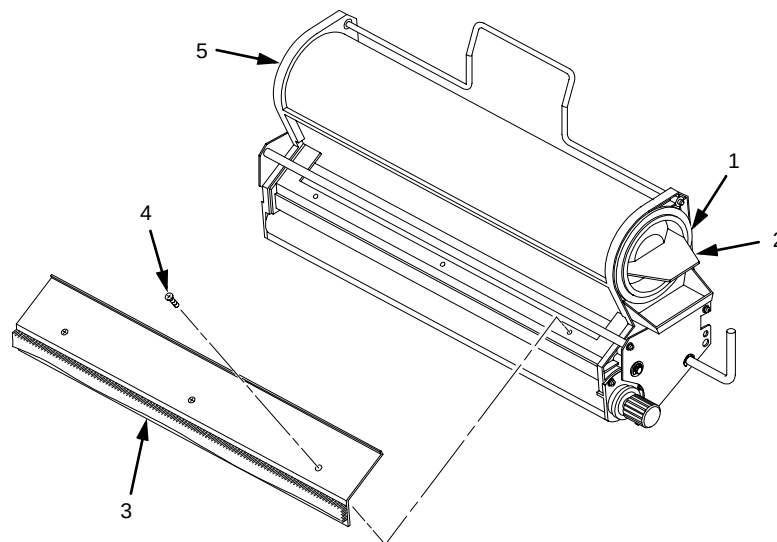
The toner sensor is sensitive to both electrostatic discharge (ESD) and positional adjustment. Do not touch the sensor with your hand or jar it from its factory-set position. (See page 126.)

1. Turn the power switch OFF.
2. Open the printer upper doors. (See page 109.)
3. Prepare a large plastic bag in which to put the developing unit.
4. Remove the developing unit (see page 123) and place it in the plastic bag, making sure it is still accessible.

IMPORTANT

When replacing developer in an existing developing unit, you must empty and clean the unit before adding new developer. Do this every 150,000 pages.

5. Turn the toner cartridge knob counterclockwise until it stops, then remove the cartridge from the developing unit.

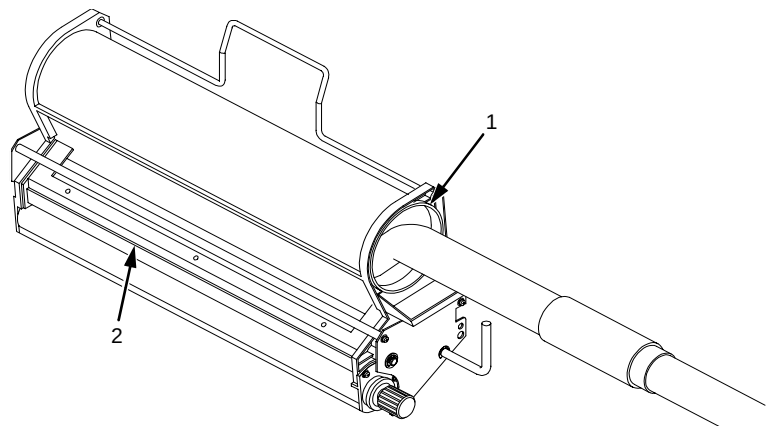


Legend:

- 1) Toner Cartridge
- 2) Toner Cartridge Knob
- 3) Cover
- 4) Screws (3)
- 5) Developing Unit

Chapter 4 Consumables Replacement

6. Remove the three screws on the developing unit cover and detach the cover.
7. Put the developing unit in the plastic bag and do the following:
 - a. Remove the developer and toner in the toner hopper by gently shaking the developing unit up and down with the opening of the toner cartridge facing downward.
 - b. Rotate the developing unit and gently shake it, to allow any remaining developer or toner to fall out of the cover slot.
8. Remove the developing unit from the plastic bag and place it on a protected surface.
9. Vacuum up any developer and toner which remains on the toner supply roller and the auger with a toner vacuum cleaner equipped with a narrow nozzle.



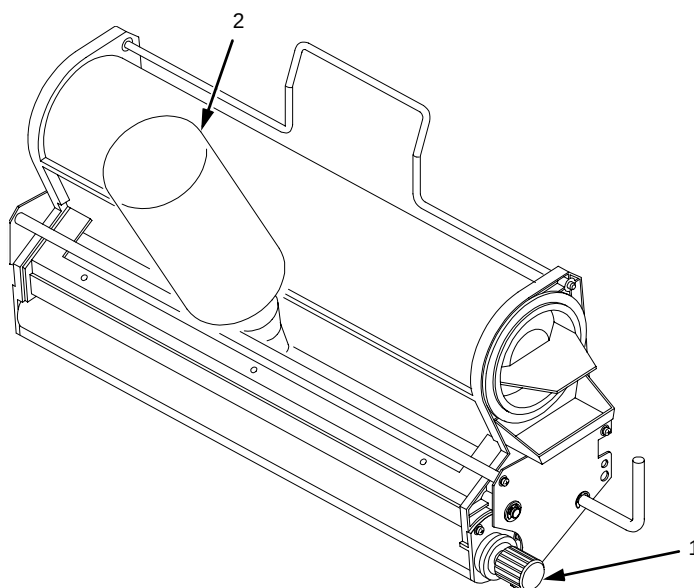
Legend:

- 1) Toner Hopper
- 2) Toner Spray-Guard Brush

10. Vacuum the toner from the toner spray-guard brush on the developing unit.
11. Shake the new developer bottle several times, remove the bottle cap, and screw the nozzle tightly onto the bottle.

Replacing Developer

12. While rotating the new developing roller knob counterclockwise, evenly pour the entire bottle of developer powder into the developing unit.



Legend:

- 1) Developing Roller Knob
- 2) Bottle of new Developer

13. Replace the cover and tighten the screws.

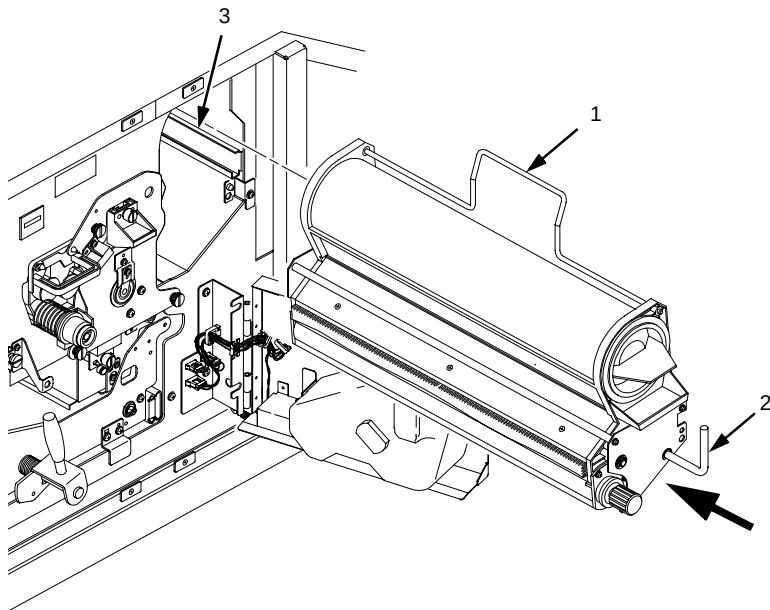
IMPORTANT

If toner or developer spills on clothing, use cold water to remove it.

14. Install the developing unit.

Install The Developing Unit

1. On the developing unit, rotate the lever fully clockwise so that it is pointing straight up.



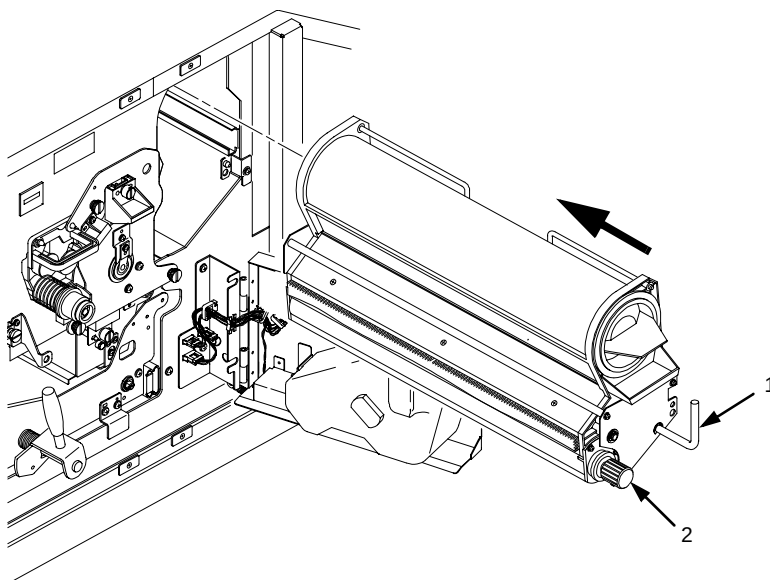
Legend:

- 1) Hanger
- 2) Lever
- 3) Guide Rail

2. Holding the lever in one hand and the hanger in the other hand, insert the developing unit on the guide rail.
3. Rotate the hanger to the right so that it rests against the developing unit, and push the developing unit in.

Install The Developing Unit

4. Rotate the developing roller knob counterclockwise until the unit drops into its final resting position. The developing unit lever should protrude through the main body of the developing unit.

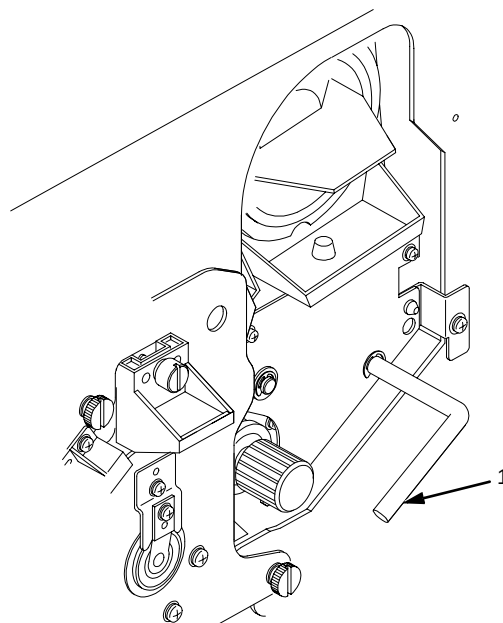


Legend:

- 1) Lever
- 2) Developing Roller Knob

Chapter 4 Consumables Replacement

5. Rotate the developing unit lever fully counterclockwise to lock the developing unit in place.



Legend:

- 1) Lever

6. Close the waste toner recovery unit and ensure that it latches.
7. Close the printer upper doors.

5

Scheduled Maintenance

Maintaining Print Quality

To maintain good print quality, clean the printer according to the schedules and information listed in this chapter.

1. Do a General Cleaning. (See page 145.)
2. Clean the main charger, precharger, and transfer charger. For cleaning instructions, see page 153 for the main charger, and page 157 for the precharger and transfer charger.
3. If print quality problems occur, clean the following areas (see page 136 for tool part numbers):
 - a. Clean the drum with the drum freshener (only when smears appear on print samples due to the drum).
 - b. Clean the LED array and the SELFOC[®] lens (LED print head) with the Toraysee[™] cloth.
 - c. Clean the fuser cover glass with a razor blade or the cover glass scraper.

If the print quality is still poor after cleaning the printer, the chargers may need to be replaced. Contact your authorized service representative for further assistance.

NOTE: For replacement intervals, see the maintenance schedules that begin on page 138.

Maintenance Tools

To maintain the printer, you need the following tools:

Item	Part Number
Brush Cleaner	703531-169
Drum Auxiliary Rod	703531-170
Drum Freshener Pad	703531-171
Fuser Cover Glass Scraper	703531-187
Special Dry Tissue Paper	703531-188
Standard Toner Vacuum Cleaner	See below for recommended models
Toraysee Cloth	703531-183
Wire Cleaner	703531-168
9 inch Phillips #1 Screwdriver	N/A

Recommended toner vacuum cleaner models are:

- 3M® model 497-AJM standard VAC with Type 1 filter
- 3M model 497-AB 220V with Type 1 filter
- Hitachi® CV-TN10 with TN-15 filter

Service Level Page Counts

IMPORTANT

Keep a record of all maintenance done on your printer. Maintenance log sheets are provided in Appendix A. Photocopy the pages and keep your maintenance log in a binder near the printer. Every time you or your service provider do printer maintenance make an entry in the log.

Each time you complete a level of preventive maintenance, you must reset the service level page count by selecting the User Maintenance option on the Maintenance menu. (See page 91.)

Service Level Page Counts

Levels A, B, and C are your responsibility, while levels D through H are the responsibility of your service provider.

When the page count reaches one of the maintenance intervals listed below, the control panel displays one of the following messages:

User Maint Level X	(User)
Tech Service Level X	(Service Technician)

Service Level X represents the level of service required:

- Level A= every 15,000 pages
- Level B= every 150,000 pages
- Level C= every 600,000 pages
- Level D= every 300,000 pages
- Level E= every 600,000 pages
- Level F= every 900,000 pages
- Level G= every 1,200,000 pages
- Level H= every 2,400,000 pages

A service level includes all the levels that precede it. For example, at 150,000 pages, you do Level B *and* Level A service. At 900,000 pages, your service provider will do Level F, Level E, and Level D service.

Note that this condition does not cause the printer to stop printing. When one of the above messages appears, you should perform the appropriate scheduled maintenance or call your factory-trained service representative to perform the maintenance.

Clearing Service Level Messages

When you have done a level of service, clear the page count for that service level. Note that when you clear a lower service level, the levels above it are also cleared. For example, clearing level C also clears levels A and B.

To clear a service level (level A, for example), select the Maintenance menu from the control panel, select the User Maint option, then select “Clear Level A” by pressing ENTER.

Maintenance Schedules

Cleaning Schedule

Each time you do maintenance, you must reset the service level page count by selecting the User Maintenance option on the Maintenance menu. (See page 91.) This removes the maintenance error message.

Do the following actions in Table 2 after the specified number of letter size pages (4% coverage) have been printed. Appendix A, “Maintenance Log Sheets,” contains log sheets you can photocopy.

Table 2. User Cleaning Responsibility

Action	Frequency (Pages)	Service Level
General cleaning	15,000; See Note 1	A
Major cleaning	150,000	B
Note 1: Every 15,000 pages or 6 paper jams, whichever occurs first.		

Replacement Schedule

Replacement Schedule

Replace the following items after the specified number of letter size pages (4% coverage) have printed. Appendix A, "Maintenance Log Sheets," contains log sheets you can photocopy.

Table 3. User Responsibility - Replacement

Item	Part Number	Frequency (Pages)	Service Level
Toner cartridge	703532-001	21,000 See Note 1	As needed
Waste toner bottle	202984-001	150,000 See Note 2	As needed
Photoreceptor drum	703535-001	150 - 300,000 See Note 3	B (as needed)
Developer	703548-001	150,000	B
Developing Unit	705739-001	600,000	C
Note 1: Replace when the "TONER EMPTY" message displays. A guideline for the replacement is 21,000 pages (A4 size, 4% coverage). Note 2: Replace when the "WASTE TONER FULL" message appears. A guideline for the replacement is every 90,000 pages (A4 size, 4% coverage). Note 3: Inspect every 150,000 pages; clean if needed. Replace at 300,000 pages or sooner if print quality is no longer acceptable. Drum life depends upon media used and proper maintenance and operation of the printer. Print media other than bond paper (e.g. labels, card stock, plastic or vinyl) can reduce drum life as much as 50%.			

Tech Service Maintenance Level Kits

The following maintenance kits should be used after the specified letter size pages (4% coverage) have been printed.

Chapter 5 Maintenance Schedules

Level D kit is used at 300,000 pages.

Item	Part Number
Maintenance Kit, Level D, L5020	706802-001
• Main charger • Precharger • Transfer charger • Smoke filter	

Tech Service Maintenance Level Kits

Use Level E kit after printing 600,000 letter size pages.

Item	Part Number
Maintenance Kit, Level E, L5020	706806-001
• Main charger • Precharger • Transfer charger • Smoke filter • Cleaning unit • Transport belt (set of 3) • Cutter motor	

Chapter 5 Maintenance Schedules

Use Level F kit after printing 900,000 letter size pages.

Item	Part Number
Maintenance Kit, Level F, L5020	706812-001
• Main charger • Precharger • Transfer charger • Smoke filter • Xenon (flash) lamp	

Tech Service Maintenance Level Kits

Use Level G kit after printing 1,200,000 letter size pages.

Item	Part Number
Maintenance Kit, Level G, L5020	706818-001
• Main charger • Precharger • Transfer charger • Smoke filter • Cleaning unit • Transport belt (set of 3) • Cutter motor • Trigger coil unit • Developing motor unit • Exit feed roller belt	

Chapter 5 Maintenance Schedules

Use Level H kit after printing 2,400,000 letter size pages.

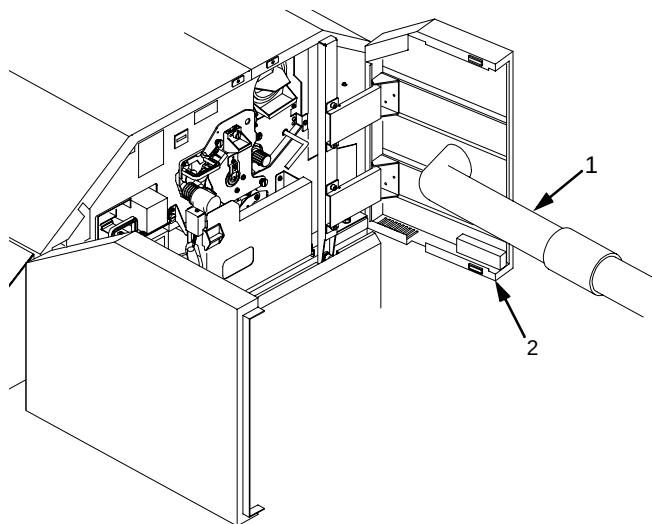
Item	Part Number
Maintenance Kit, Level H, L5020	706830-001
The kit includes the following items: • Main charger • Precharger • Transfer charger • Smoke filter • Cleaning unit • Transport belt (set of 3) • Cutter motor • Trigger coil unit • Developing motor unit • Exit feed roller belt • Lamp housing filter • EPS3 • EPS4 • Capacitor • Discharge LEDs (PEL)	

General Cleaning

To maintain optimum print quality, clean the printer regularly. Depending upon the density of your print jobs, the printer may require cleaning every 10,000 - 20,000 sheets.

Vacuuming

1. Turn the power switch OFF.
2. Open the printer upper doors. (See page 109.)
3. Using a vacuum, clean up the toner, paper dust, etc. inside the upper doors.



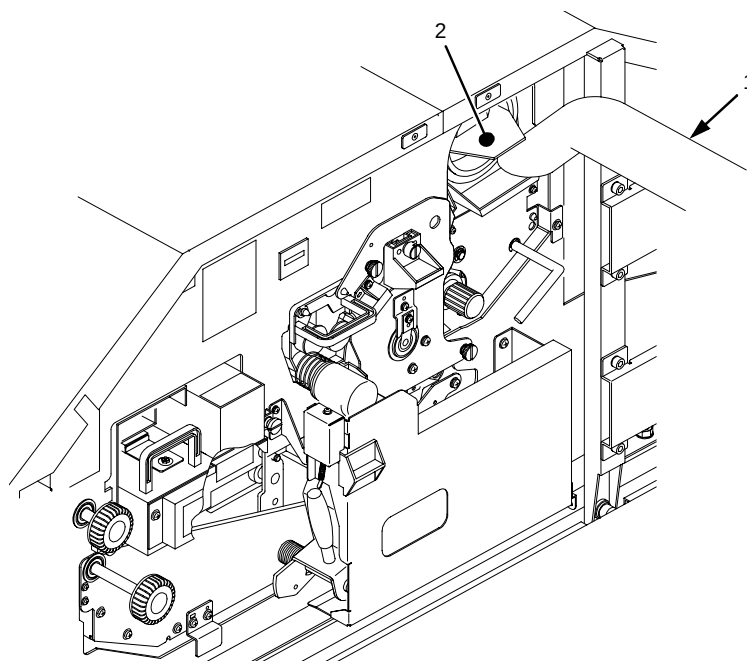
Legend:

- 1) Vacuum
- 2) Upper Door

4. Open the waste toner recovery unit. (See page 113.)

Chapter 5 General Cleaning

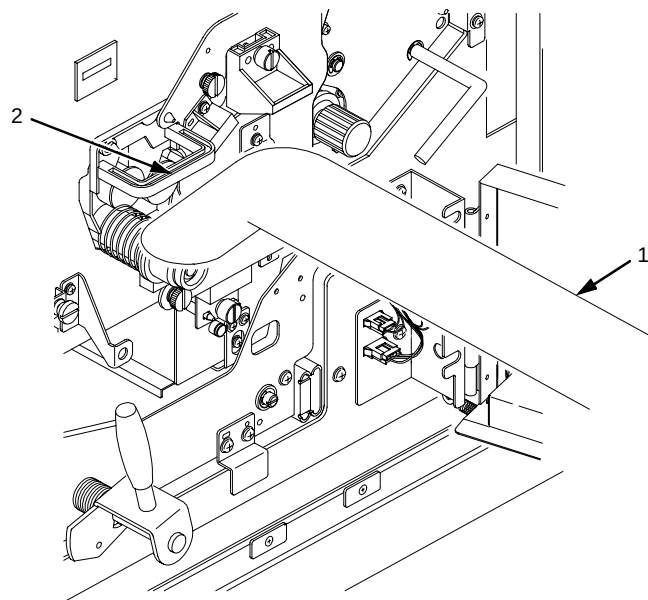
5. Vacuum the developing unit and toner hopper.



Legend:

- 1) Vacuum
- 2) Developing Unit and Toner Hopper

6. Vacuum the cleaning unit.

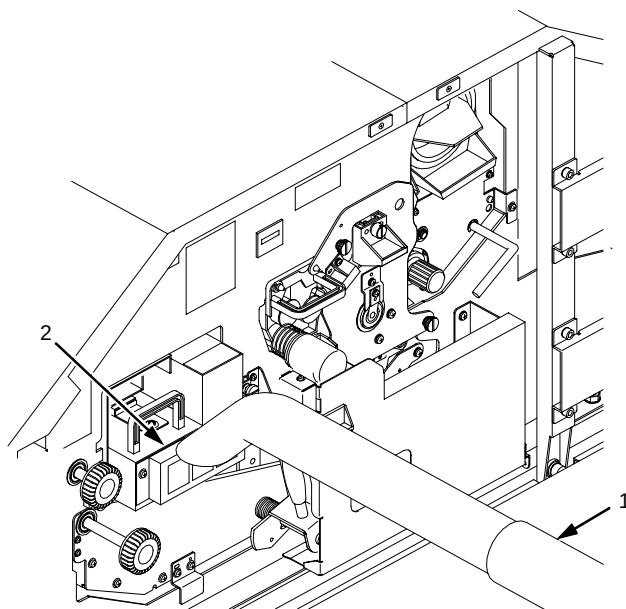


Legend:

- 1) Vacuum
- 2) Cleaning Unit

Chapter 5 General Cleaning

7. Vacuum the fuser unit.
8. Vacuum the lamp housing filter on the end of the fuser unit.



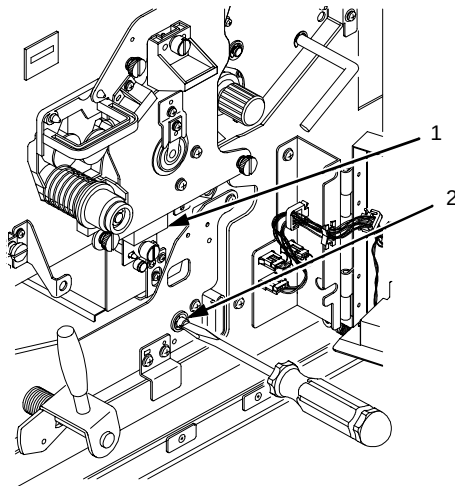
Legend:

- 1) Vacuum
- 2) Fuser Unit

Transfer Charger

CAUTION The transfer charger must be in the down position to avoid scratching the drum. Failure to perform steps 9 and 10 damages the drum.

9. Rotate the transfer elevator drive shaft counterclockwise. Watch the charger movement:
 - a. If the charger starts to move up, it is already in the down position.
 - b. If the charger starts to move down, continue to rotate the drive shaft until the charger reaches the complete down position.



Legend:

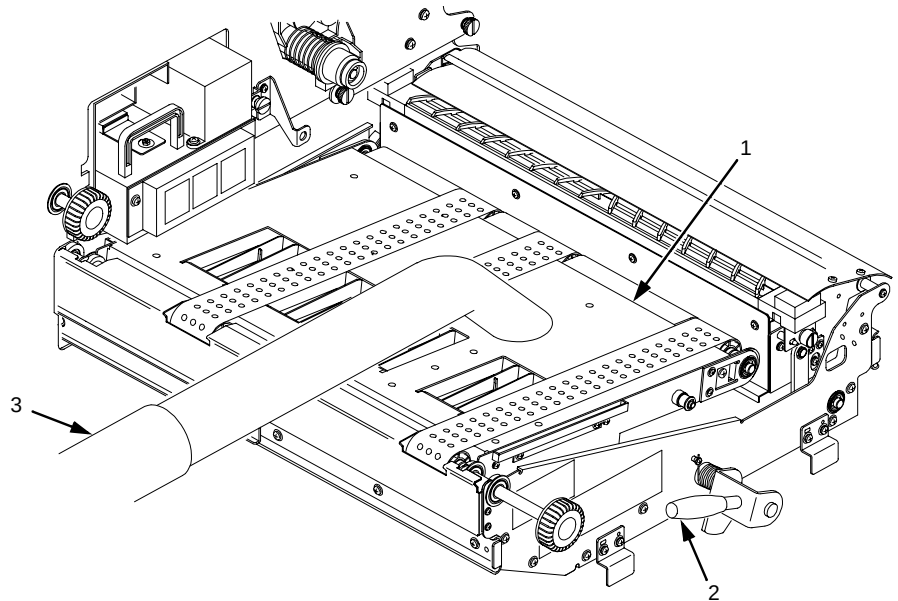
- 1) Transfer Charger
- 2) Transfer Elevator Drive Shaft

CAUTION To avoid damaging the printer or causing false paper jams, the transport lever must be in the fully down position before closing the transport unit.

10. Lower the transport surface by turning the green lever on the transport unit to the left.

Chapter 5 General Cleaning

11. Pull the transport unit toward you until it stops.
12. Vacuum the toner, paper dust, etc. Be sure to clean under the transport unit as well.



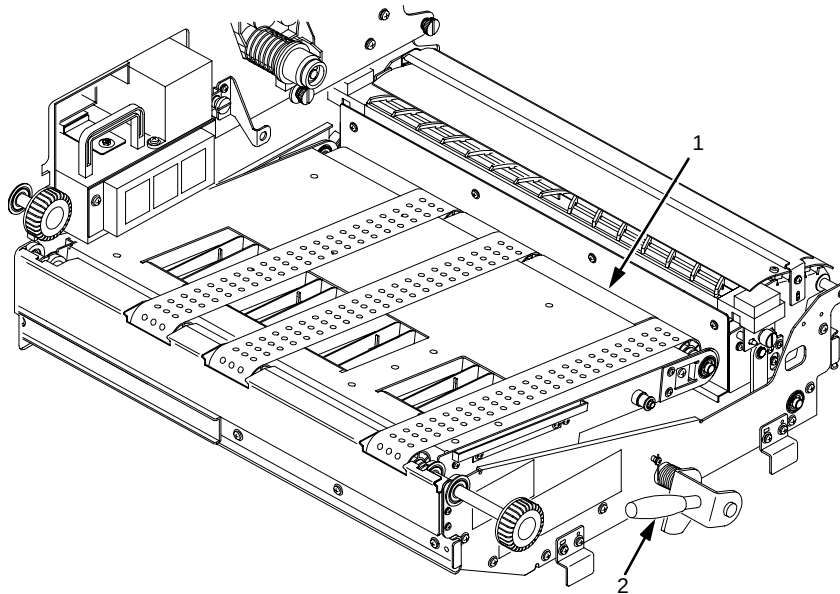
Legend:

- 1) Transport Surface
- 2) Green Lever
- 3) Vacuum

13. Wipe off the dirt on the transport surface with wet tissue paper. Make sure no paper debris is left on the surface
14. Using an ammonia-based wax-free cleaner or rubbing alcohol, clean the belts to remove residue buildup and restore their tacky surface.

Transfer Charger

15. Push the transport unit into the printer while holding down the green lever. Raise the green lever to the right to raise the transport surface.

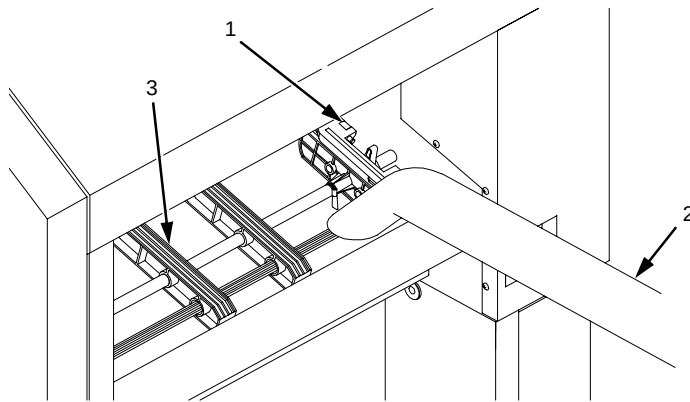


Legend:

- 1) Transport Surface
- 2) Green Lever

Chapter 5 General Cleaning

16. Vacuum the toner, paper dust, etc. in the tractor area.



Legend:

- 1) Paper Guide
- 2) Vacuum
- 3) Tractor

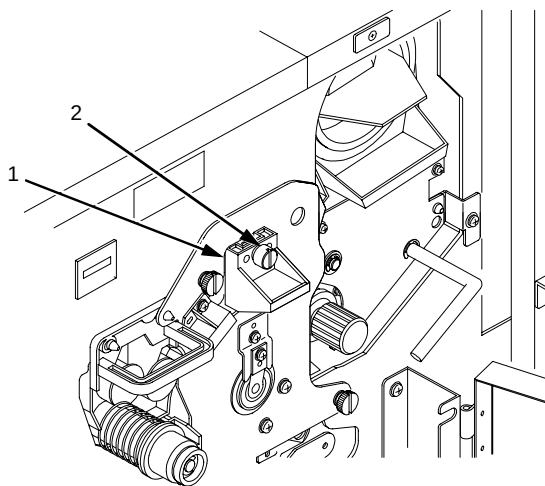
Cleaning The Chargers

1. Turn the power switch OFF.
2. Open the printer upper doors. (See page 109.)

Main Charger

CAUTION Handle the charger carefully to avoid damaging or breaking the charger wires.

3. Loosen the thumbscrew and remove the main charger by pulling it toward you.



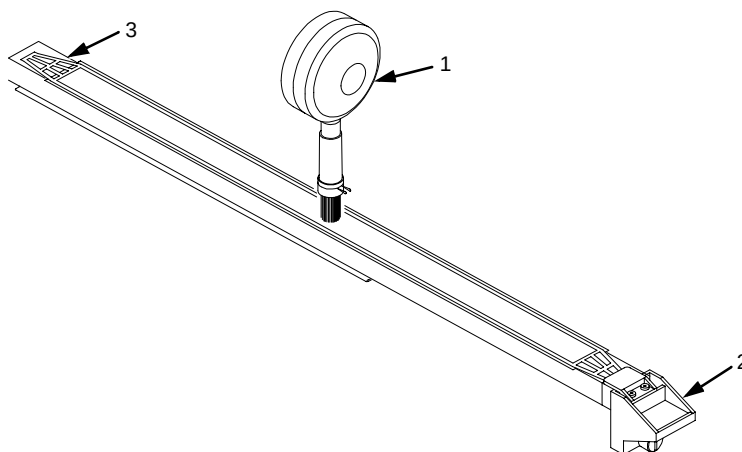
Legend:

- 1) Main Charger
- 2) Thumbscrew

4. Place the main charger on a flat, clean work surface.

Chapter 5 General Cleaning

5. Using the brush cleaner (listed on page 136), clean the exposed side of the charger grid and the body of the main charger to remove paper dust, etc., as shown below.

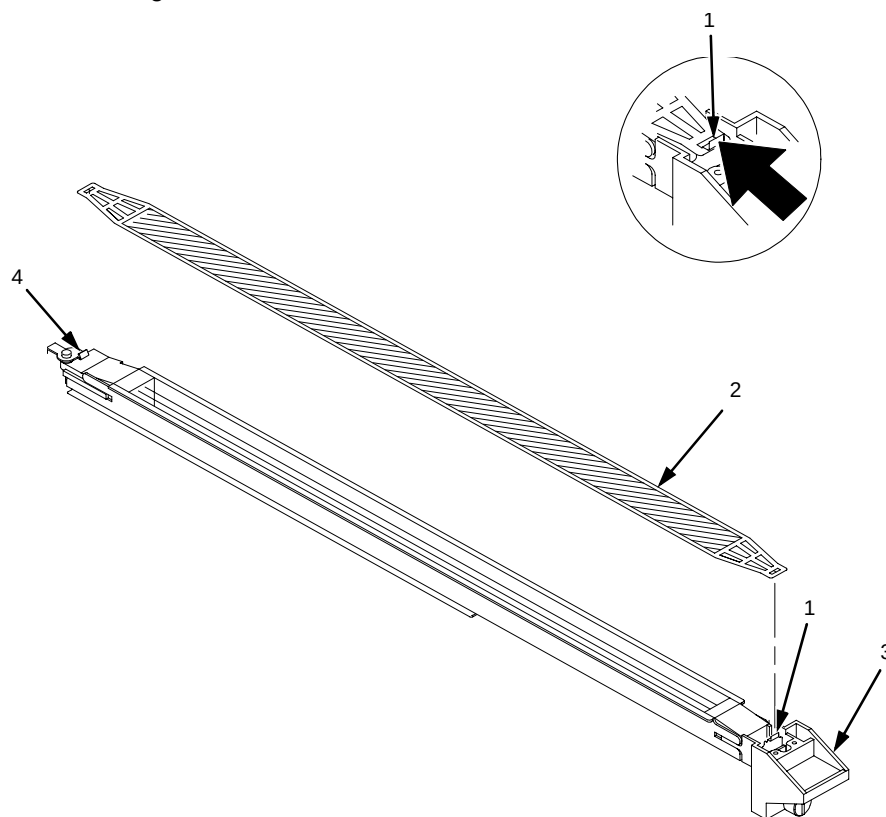


Legend:

- 1) Brush Cleaner
- 2) Main Charger
- 3) Charger Grid

Cleaning The Chargers

6. Position the main charger with the charger grid up and the front end of the charger toward you, as shown in the following figure. Remove the charger grid from the main charger as follows:
 - a. While pressing the front retaining tab toward the rear of the charger, unhook the rear end of the charger grid from the rear retaining tab.
 - b. Release the front retaining tab, then remove the charger grid from it.

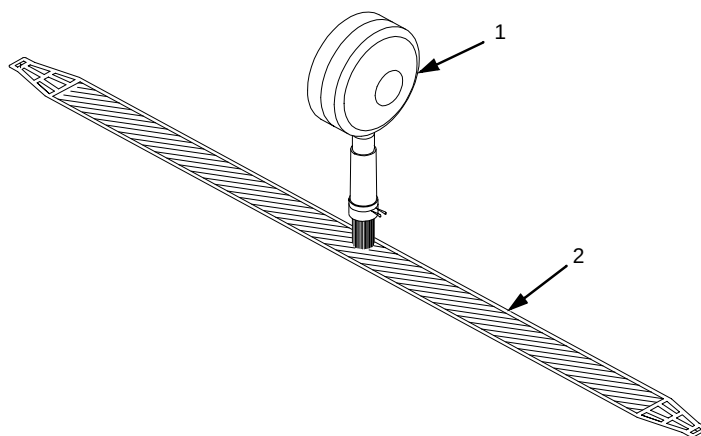


Legend:

- 1) Front Retaining Tab
- 2) Charger Grid
- 3) Main Charger
- 4) Rear Retaining Tab

Chapter 5 General Cleaning

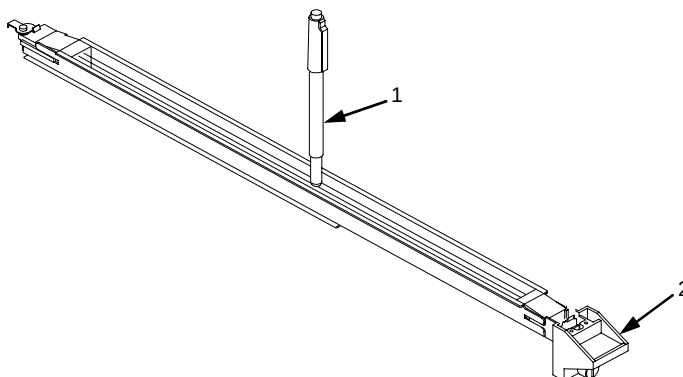
7. Using the brush cleaner, clean both sides of the charger grid.



Legend:

- 1) Brush Cleaner
- 2) Charger Grid

8. Using the wire cleaner (listed on page 136), clean the two wires in the main charger. When clean, the wires feel smooth.



Legend:

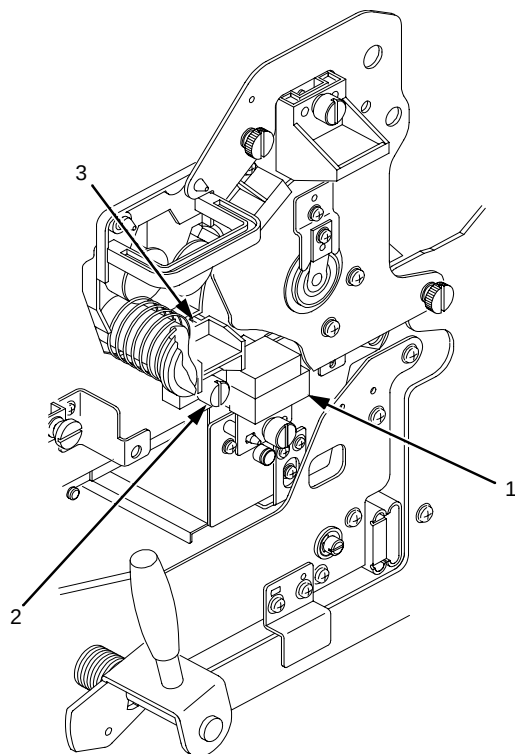
- 1) Wire Cleaner
- 2) Main Charger

Cleaning The Chargers

9. Install the charger grid.
10. Return the main charger to its original position. Fasten the main charger screw to secure it.

Precharger And Transfer Charger

11. Open the waste toner recovery unit.
12. Loosen the precharger thumbscrew and transfer/separator charger thumbscrew, and remove the chargers by pulling them toward you.



Legend:

- 1) Transfer/Separator Charger
- 2) Thumbscrews
- 3) Precharger

13. Place the chargers on a flat, clean work surface.

14. Using the brush cleaner and the wire cleaner (listed on page 136), remove the dust and dirt on the wires. The precharger contains one wire, while the transfer/separator charger contains two wires. When clean, the wires feel smooth.
15. After cleaning, return the chargers to their original positions. Fasten the charger screws to secure them.

Cleaning The Fuser Unit Cover Glass

WARNING

The fuser unit remains hot after operation. Wait until it has *completely* cooled down before handling it.

WARNUNG

Die Einbrennvorrichtung behält auch nach dem Betrieb ihre Temperatur bei. Fassen Sie sie erst an, wenn sie *vollständig* abgekuhlt ist.

AVISO

La unidad de fusor estará a alta temperatura después de funcionar. Espere a que se haya en friado *por completo* antes de manipularia.

ATTENTION

L'unité de four est encore très chaude après chaque opération. Attendez qu'elle refroidisse complètement avant de la manipuler.

AVVERTENZA

Dopo l'uso, l'unità fusore é calda. Attendere il *completo* raffreddamento dell'unità prima di intervenire sulla medesima.

Do not scratch or place your hands directly on the cover glass.

IMPORTANT

Do not use any cleaners or chemicals on the Fuser Unit Cover Glass. Use only the scraper.

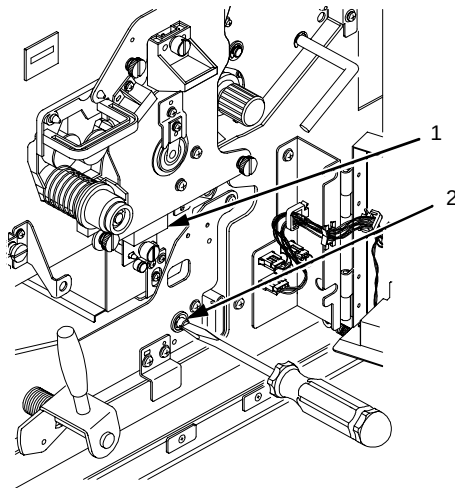
1. Turn the power switch OFF.
2. Open the printer upper doors. (See page 109.)

Cleaning The Fuser Unit Cover Glass

3. Open the waste toner recovery unit.

CAUTION The transfer charger must be in the down position to avoid scratching the drum. Failure to perform steps 4 and 5 damages the drum.

4. Rotate the transfer elevator drive shaft counterclockwise.
Watch the charger movement:
 - a. If the charger starts to move up, it is already in the down position.
 - b. If the charger starts to move down, continue to rotate the drive shaft until the charger reaches the complete down position.



Legend:

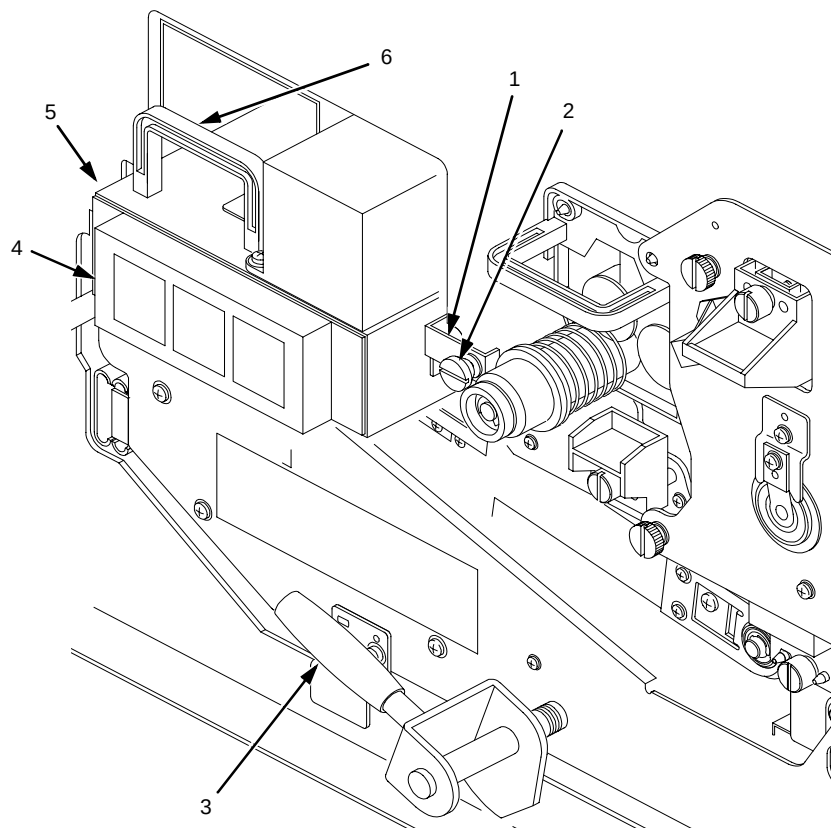
- 1) Transfer Charger
- 2) Transfer Elevator Drive Shaft

CAUTION To avoid damaging the printer or causing false paper jams, the transport lever must be in the fully down position before closing the transport unit.

5. Lower the transport surface by turning the green lever on the transport unit to the left.

Chapter 5 General Cleaning

6. Loosen the thumbscrews (2) on the right and left fuser unit holding plates.



Legend:

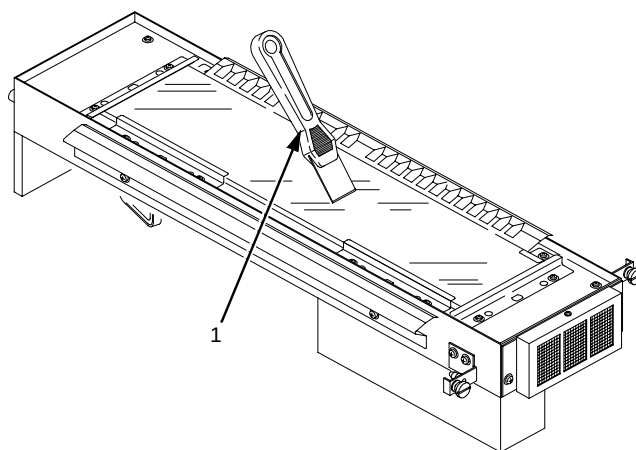
- 1) Holding Plate
- 2) Thumbscrew
- 3) Green Lever
- 4) Fuser Unit
- 5) Thumbscrew (not visible)
- 6) Handle

7. Grasp the handle and pull out the fuser unit until the second handle is visible.
8. With the other hand, grasp the second handle and remove the fuser from the printer.

Cleaning The Fuser Unit Cover Glass

CAUTION Do not scratch or place your hands directly on the cover glass. Fingerprints on the cover glass or lamps will cause them to break.

9. Place the fuser on a clean, flat surface with the cover glass facing up.
10. Using the fuser cover glass scraper (listed on page 136), remove the dirt and toner buildup on the cover glass surface.



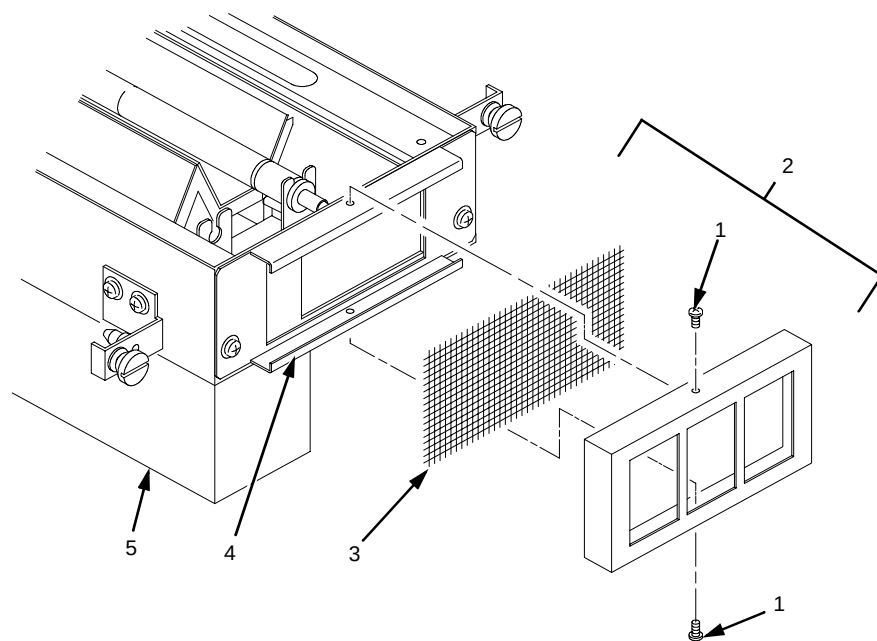
Legend:

- 1) Scraper

11. Wipe away any remaining toner or dirt with a Toraysee cloth (listed on page 136).

Chapter 5 General Cleaning

12. Remove the two screws that secure the filter housing to the filter, then remove the filter.



Legend:

- 1) Screws (2)
- 2) Filter Housing
- 3) Filter
- 4) Filter Holding Plate
- 5) Fuser Unit

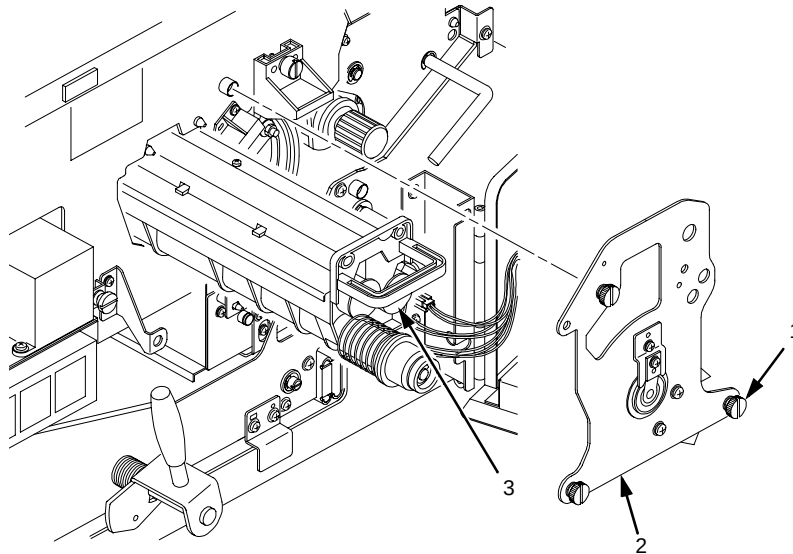
13. Vacuum the filter, then install it.
14. Vacuum any paper dust from the printer frame.
15. Install the fuser, making sure that the guide pins in the screw bracket align with the holes in the side frame of the printer.

Major Cleaning

Do a major cleaning every 150,000 pages to keep your printer in the best working order.

Cleaning Unit

1. Turn the power switch OFF.
2. Open the printer upper doors. (See page 109.)
3. Open the waste toner recovery unit. (See page 113.)
4. Loosen the three thumbscrews securing the drum plate and remove the drum plate.
5. Remove the cleaning unit by grasping its handle and pulling it toward you.



Legend:

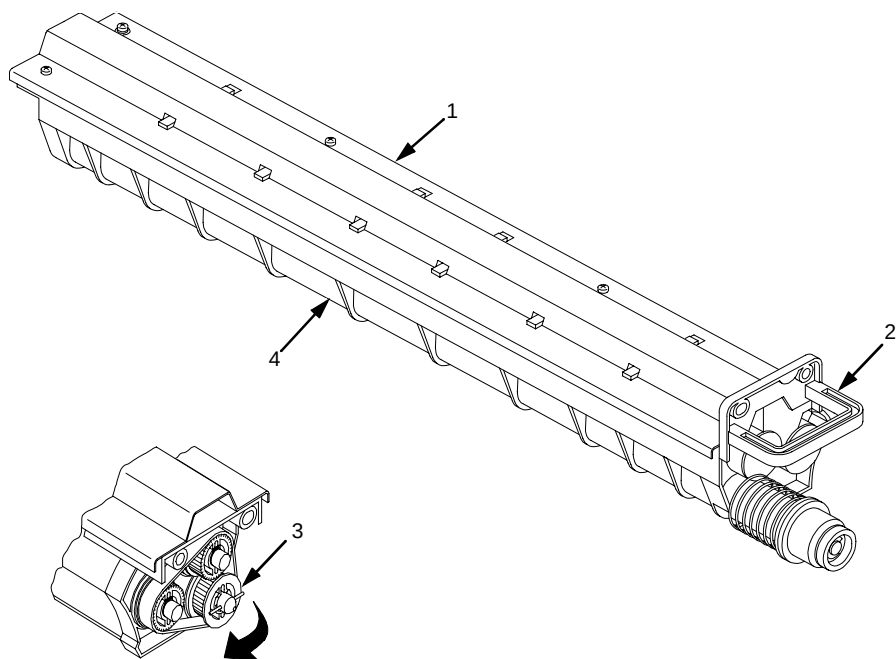
- 1) Thumbscrews (3)
- 2) Drum Plate
- 3) Cleaning Unit Handle

Chapter 5 Major Cleaning

IMPORTANT To avoid spilling toner, do not turn the cleaning unit upside down.

6. Vacuum the brush on the cleaning unit. Turn the end of the shaft to rotate the brush. Continue to rotate and vacuum the brush until the entire brush surface has been cleaned.

CAUTION Do not touch the brush surface with your hand.

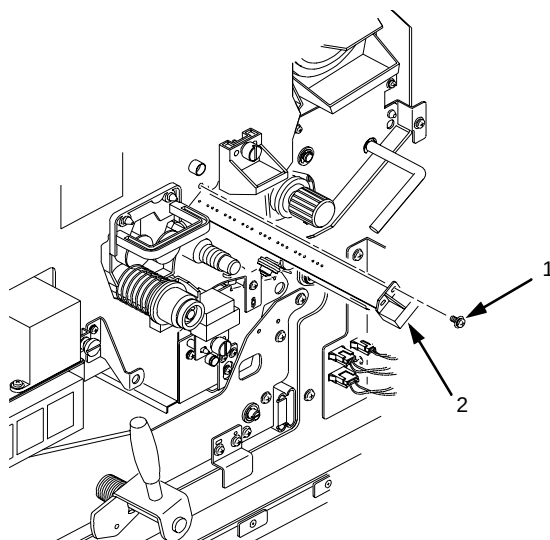


Legend:

- 1) Cleaning Unit
- 2) Cleaning Unit Handle
- 3) Rotate Shaft
- 4) Brush

CAUTION Do not flex the discharge LED, or it may break.

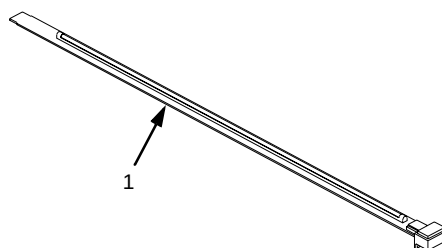
7. Remove the discharge LED screw.



Legend:

- 1) Screw
- 2) Discharge LED

8. Remove the discharge LED by pulling it toward you.
9. Using a Toraysee cloth (listed on page 136), wipe off the dirt on the discharge LED.



Legend:

- 1) Discharge LED

10. Install the discharge LED.

Cleaning The Photoreceptor Drum

CAUTION When cleaning the photoreceptor drum, observe the following precautions:

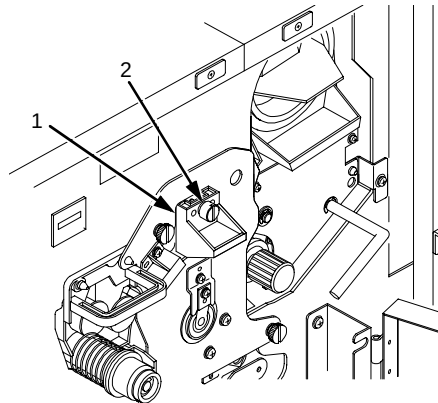
- Do not touch the drum surface with your hands.
 - To prevent the drum surface from being scratched, clean it in a location free of dust.
 - Cleaning the drum may result in wiping stains. A drum left unused in the printer for a long time after cleaning may especially be affected. Therefore, after cleaning and installing the drum in the printer, use maximum size paper to print an image repeatedly until no stains remain. Stains usually clear after printing a few dozen pages.
1. Remove the photoreceptor drum from the printer. (See page 115.)
 2. Place the drum on a covered work surface.
 3. If the drum is only slightly dirty, clean it with ethanol or isopropyl alcohol. **Do not use acetone.**
 4. If the drum has toner buildup, clean it with the drum freshener pad. (See page 136.) Turn the drum little by little while polishing the drum surface with the freshener pad. Polish with a slight force in the direction of the drum circumference, using a circular motion. Let the polished areas slightly overlap each other, and polish the entire drum surface two or three times.

CAUTION Press lightly when polishing the drum surface, as too much pressure can damage the drum.

5. Using the special dry tissue paper (see page 136), thoroughly wipe the drum freshener off the drum surface.
6. Wipe the drum surface again using a Toraysee cloth. (See page 136.)

Cleaning The Photoreceptor Drum

7. To avoid exposing the drum to light for too long, temporarily pack the drum in its original packaging material, and close the box cover. Set the drum aside.
8. Remove the drum auxiliary rod from the drum shaft.
9. Wipe the drum shaft clean with a cloth.
10. Loosen the thumb screw and remove the main charger by pulling it toward you.
11. Clean the developing unit area with a vacuum cleaner and a soft cloth.



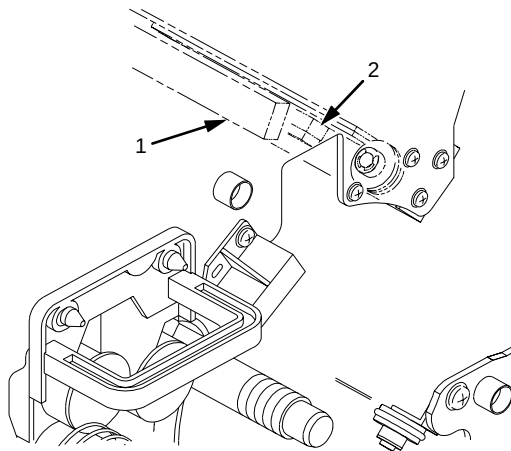
Legend:

- 1) Main Charger
- 2) Thumbscrew

CAUTION When wiping the SELFOC® lens, be certain not to apply excessive force to the drum surface potential sensor located near the SELFOC lens, as this may cause the sensor to be dislocated. (If this happens, contact your service representative.)

12. Wipe the SELFOC lens by moving a Toraysee cloth (See page 136) from the inner part of the printer toward you. Wipe the lens in this manner several times until there is no more dirt on the cloth.

NOTE: Always wipe the SELFOC lens with the unused side of the Toraysee.



Legend:

- 1) SELFOC Lens
- 2) Drum Surface Potential Sensor

13. Install the main charger.
14. Install the photoreceptor drum. (See page 115.)
15. Install the developing unit. (See page 130.)
16. Install the cleaning unit.

6

Troubleshooting

Troubleshooting

This chapter discusses diagnostic tests, paper jams, and system messages (status and error).

Diagnostics

The printer includes diagnostic circuits and software to aid in the discovery, prevention, and correction of system problems and failures. The printer has both offline and on-line diagnostics.

Offline Diagnostics

Most of the software diagnostics are executed when the printer is powered on, and when you request diagnostic information through the control panel.

Each time the printer is powered on, it performs a power-on self test. There is no printout during this test. However, the printer displays any errors on the control panel, accompanied by an audible alarm.

You may request the following diagnostic and configuration information via the control panel, through various menus:

- **Test Print:** Prints various predefined graphics pages to verify that the printer can print properly on the entire page (Test Print menu).
- **Print Statistics:** Displays all accumulated print engine statistics, such as number of pages printed and power-on time. This is a display-only feature; there is no printout (Print Statistics menu).

- **Print Configuration:** Prints all current configuration parameters in the printer, including print statistics (Config. Control menu).

Online Diagnostics

When it is online, the printer senses and reports problems or conditions as they arise. When an error is detected, the printer halts, lights the appropriate LED, and displays the proper error message on the control panel. The error message remains displayed until the error condition is cleared and you press CLEAR.

After the error is cleared, the printer reprints any pages that were not ejected prior to the error, provided the Reprint on Fault option is enabled. (See the Paper Control menu on page 56.)

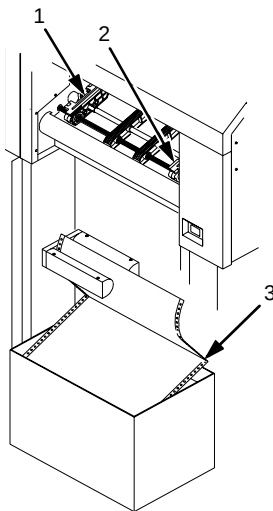
Paper Jams

Paper Jam Near The Tractor

1. Raise the tractor gates.
2. Pull out the jammed paper. If the end of the paper is crumpled, tear it away from the perforation.

Paper Jams

3. Reload the paper. The first fold of the paper should be facing towards the printer; otherwise, a paper jam could occur. (see illustration). Do not push the paper past the tractors as there is a paper jam sensor that will sense the paper and return a paper jam error.

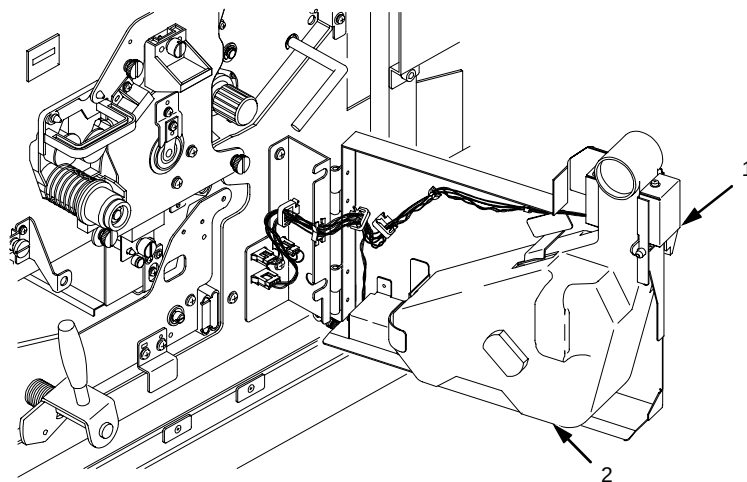


Legend:

- 1) Left Tractor
- 2) Right Tractor
- 3) First paper fold is toward printer

Paper Jam Near The Paper Output Section

1. When paper motion stops, wait 15 seconds, then open the upper doors. (See page 109.)
2. Open the waste toner recovery unit.

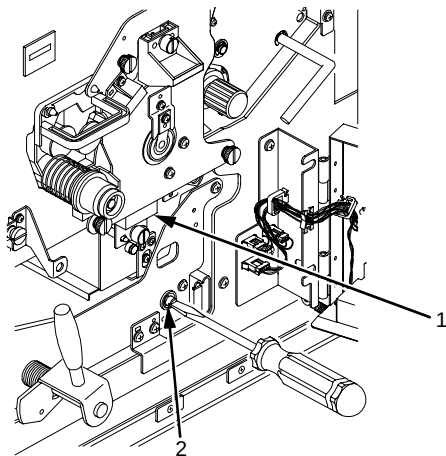


Legend:

- 1) Opening Lever
- 2) Waste Toner Recovery Unit

CAUTION The transfer charger must be in the down position to avoid scratching the drum. Failure to perform steps 3 and 4 damages the drum.

3. Rotate the transfer elevator drive shaft counterclockwise. Watch the charger movement:
 - a. If the charger starts to move up, it is already in the down position.
 - b. If the charger starts to move down, continue to rotate the drive shaft until the charger reaches the fully down position.

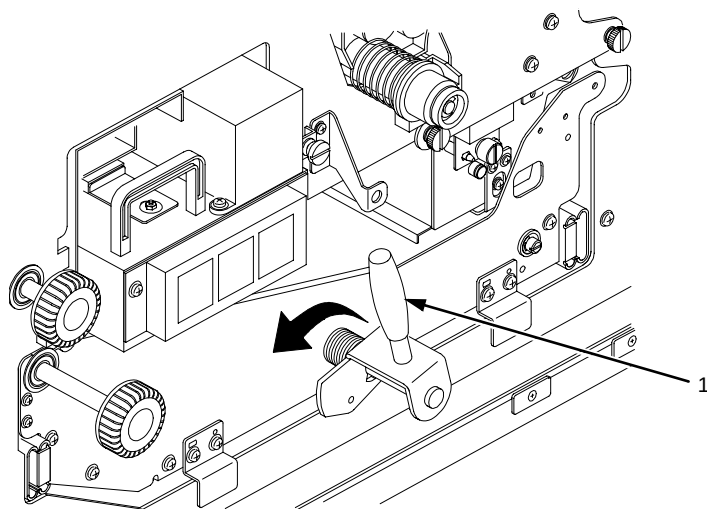


Legend:

- 1) Transfer Charger
- 2) Transfer Elevator Drive Shaft

CAUTION To avoid damaging the printer or causing false paper jams, the transport lever must be in the fully down position before opening the transport unit

4. Lower the transport unit by turning the green lever on the transport unit to the left.

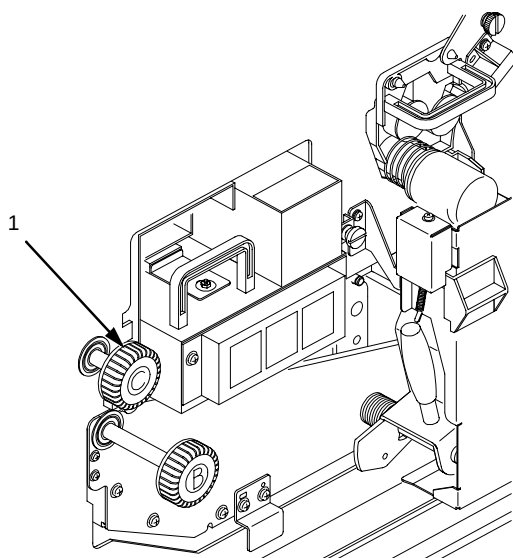


Legend:

- 1) Green Handle

5. Check for and remove any paper jammed in the transport unit.

6. Turn knob C clockwise 90° to raise the scuff roller holding the paper.



Legend:

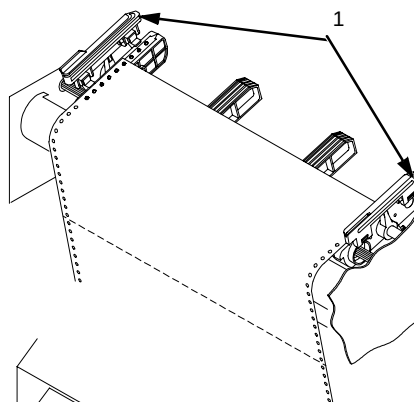
- 1) Knob C

7. Separate the fanfold paper at the perforations on both the paper input *and* the output sections. Then remove the jammed paper by pulling it out.

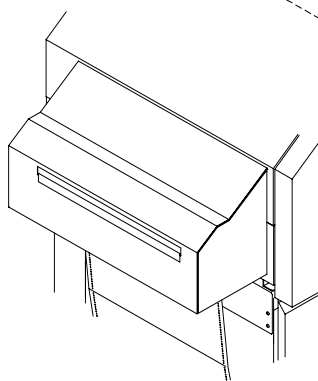
Chapter 6 Troubleshooting

When removing the paper from the paper input section, raise the tractor gates first, then pull out the jammed paper.

Input Section



Output Section



Legend:

1) Tractor Gate

CAUTION To avoid damaging the printer or causing false paper jams, the transport lever must be in the fully down position before closing the transport unit.

8. After removing the pieces of jammed paper, restore the transport unit and waste toner recovery unit to their original positions, and close the front cover.
9. Reload the paper.

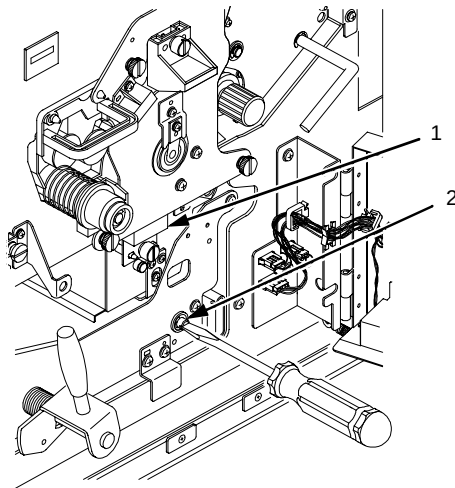
Paper Jam In The Transport Input Section

1. When paper motion stops, wait 15 seconds, then open the upper doors. (See page 109.)
2. Open the waste toner recovery unit cover.

CAUTION

The transfer charger must be in the down position to avoid scratching the drum. Failure to perform steps 3 and 4 damages the drum.

3. Rotate the transfer elevator drive shaft counterclockwise. Watch the charger movement:
 - a. If the charger starts to move up, it is already in the down position.
 - b. If the charger starts to move down, continue to rotate the drive shaft until the charger reaches the complete down position.

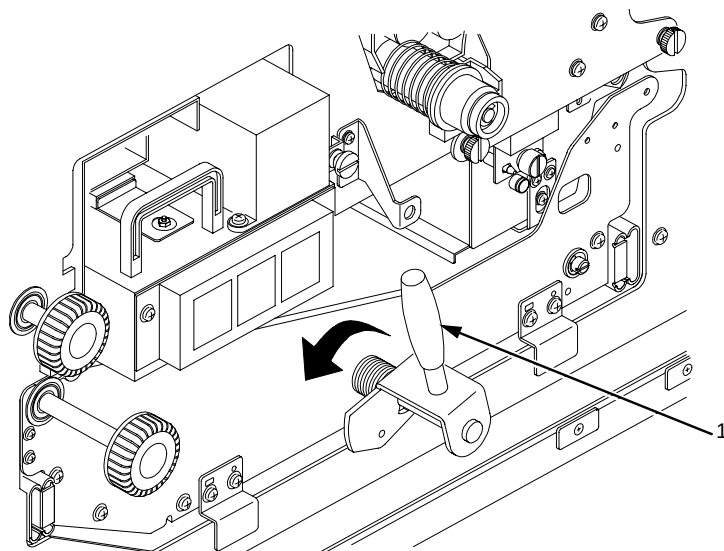


Legend:

- 1) Transfer Charger
- 2) Transfer Elevator Drive Shaft

CAUTION To avoid damaging the printer or causing false paper jams, the transport lever must be in the fully down position before opening or closing the transport unit.

4. To lower the transport route surface, turn the green transport unit lever to the left.



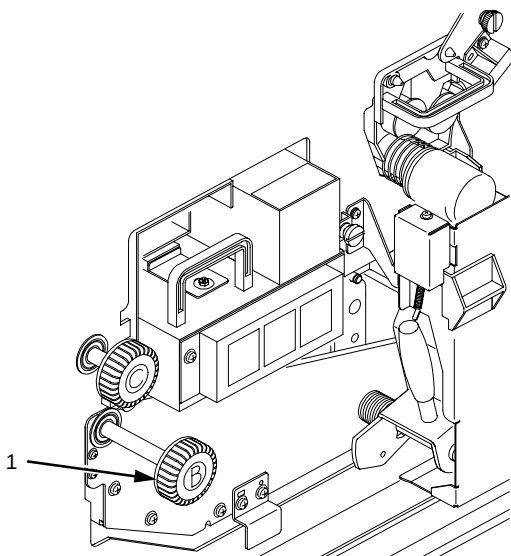
Legend:

- 1) Green Lever

5. Manually clear the paper jam.
6. Restore the transport unit and the waste toner recovery unit to their original positions, and close the upper doors.

Paper Jam In The Transport Output Section

1. When paper motion stops, wait 15 seconds, then open the upper doors. (See page 109.)
2. Turn the green knob B counterclockwise. This causes the jammed paper to be moved to the paper feed section. Remove any jammed paper.



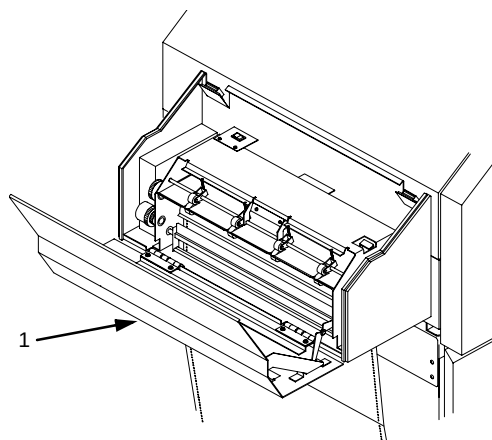
Legend:

- 1) Knob B

3. Close the upper doors.

Paper Jam In The Power Paper Stacker

1. When paper motion stops, wait 15 seconds, then tear the paper from the output section of the printer.
2. Open the stacker cover and clear any paper jams.

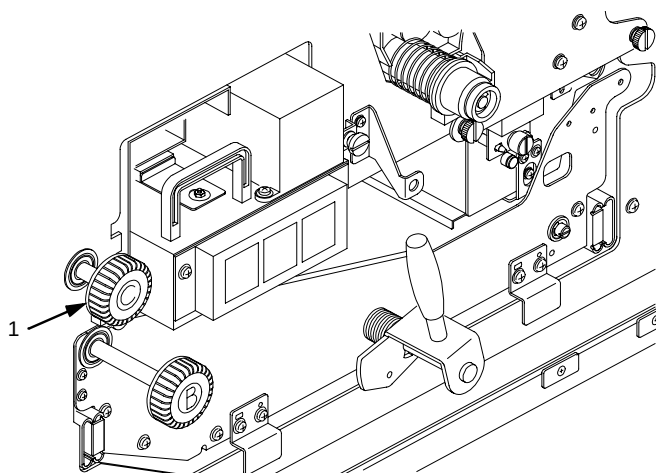


Legend:

- 1) Stacker Cover

3. Open the upper doors. (See page 109.)

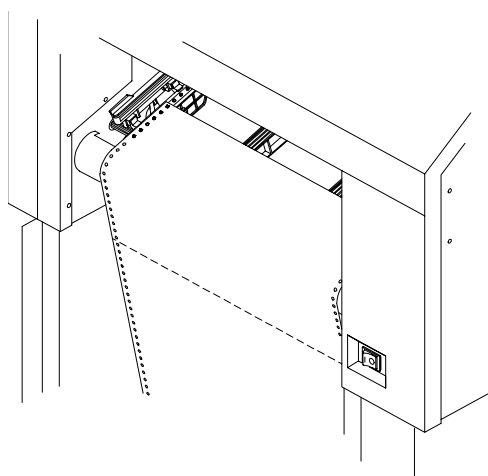
4. Turn Knob C, clockwise to unlock it.



Legend:

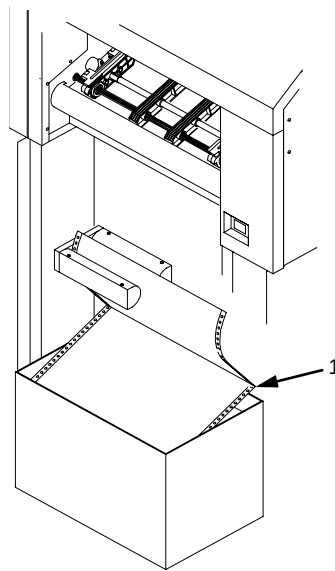
- 1) Knob C

5. Pull the paper out from the paper entrance.



Chapter 6 System Status And Error Messages

6. Reload the paper being sure to load it correctly, with the first perforation facing the printer.



Legend:

- 1) First Perforation

7. Rotate Knob C counterclockwise to lock it.
8. Close the upper doors.
9. Press CLEAR on the control panel.
10. When the error is cleared, press ONLINE. The printer resumes printing.

System Status And Error Messages

When an error occurs, the printer displays an appropriate message on the control panel LCD. Some errors are operator-correctable, some require field service, and others require reprinting.

Operator-correctable errors include paper jams, and missing consumables. After correcting the error condition, press CLEAR to remove the message from the display and place the printer offline.

Reprinting Pages After Fault Condition

If any data resides in the print buffer, it is then printed. Press ONLINE to place the printer online.

Errors requiring field service are printer failures that require the attention of service personnel. Before calling your service representative, press CLEAR to attempt to remove the message from the display. If the message disappears, the original message may have been a false error indication. If the message reappears, call for service.

Errors requiring reprinting are those errors which require reprinting to recover from an error condition. These are discussed in detail in the following topics.

Reprinting Pages After Fault Condition

The printer handles errors in three ways, depending on your configuration of the Reprint on Fault option in the Paper Control menu.

If Reprint On Fault Is *Enabled* (The Default):

Any pages left in the printer at the time of failure are reprinted. No data is lost.

The printer reprints all pages that have not completely exited the printer at the time of failure. The exact number of pages that are reprinted is determined by the length of the page and where within the page the fault occurred.

If Reprint On Fault Is *Disabled*:

Any pages left in the printer at the time of failure are not reprinted. Data is lost (you need to reprint the lost pages according to your application software).

If Reprint On Fault Is *Confirm*:

The control panel on the printer returns a message asking whether or not to reprint. Answer Yes to reprint, answer No if a reprint is not necessary.

Whether Reprint On Fault Is *Enabled, Disabled, Or Confirm*:

After a paper jam, you may need to reload the paper onto the tractors.

Table 4, "Error Messages," on page 188, designates those errors that require reprinting to recover from an error condition.

NOTE: Some errors require reprinting, regardless of your printer configuration. Refer to Table 4 for details.

Procedure For Fault Clearing - Reprint On Fault *Disabled*

1. A fault occurs.
2. Correct the fault condition.
3. Press CLEAR.
4. The STAND BY LED blinks and the following message appears while the printer attempts to clear the fault:

Standby...
Clearing Fault

If the fault is not cleared:

- a. The printer beeps and briefly displays the following message:

Faults Not Clearing

- b. The printer then redisplay the original fault message, or any other uncleared fault message.
- c. Attempt to clear the fault condition again, or contact your service representative.

If the fault is cleared, and if you do *not* need to reload the paper into the tractors (for example, the printer ran out of toner):

- a. The printer goes OFFLINE.
- b. Press ONLINE to resume printing.

Reprinting Pages After Fault Condition

If the fault is cleared, and if you need to reload paper into the tractors (such as after a paper jam), the following message appears:

Reload Paper
in Tractors

- a. Reload the paper onto the tractors.
- b. Press CLEAR.
- c. Press ONLINE to resume printing. Note that pages have been lost.

If the fault is cleared, and if you have already reloaded the paper while clearing the fault condition (in Step 2), the following message appears:

Not Reprinting
Failed Pages

5. Press ONLINE to resume printing. Note that pages have been lost.

IMPORTANT

If Reprint on Fault is disabled and an error occurs, and if either the “RELOAD PAPER IN TRACTORS” or “NOT PRINTING FAILED PAGES” message appears, then any pages removed from the printer are not reprinted, and the data on them is lost.

Procedure For Fault Clearing - Reprint On Fault *Enabled*

1. A fault occurs.
2. Clear the fault condition.
3. Press CLEAR.
4. The STAND BY LED blinks and the following message appears while the printer attempts to clear fault:

Standby...
Clearing Fault

Chapter 6 System Status And Error Messages

If the fault is not cleared:

- a. The printer beeps and briefly displays the following message:

Faults Not Cleared

- b. The printer then redisplay the original fault message, or any other uncleared fault message.
- c. Attempt to clear the fault condition again, or contact your service representative.

If the fault is cleared, and if you do *not* need to reload the paper into the tractors (for example, the printer ran out of toner):

- a. The printer goes OFFLINE.
- b. Press ONLINE to resume printing.

If the fault is cleared, and if you need to reload paper into the tractors (such as after a paper jam), the following message appears:

Clear Paper Path
for Reprint

- a. Reload the paper onto the tractors.
- b. Press CLEAR. The printer reprints only the pages affected by the fault (even though the message display reads "OFFLINE").
- c. Press ONLINE to resume printing.

If the fault is cleared, and if you already have reloaded the paper while clearing the fault condition (in Step 2), the following message appears:

Reprinting
Failed Pages

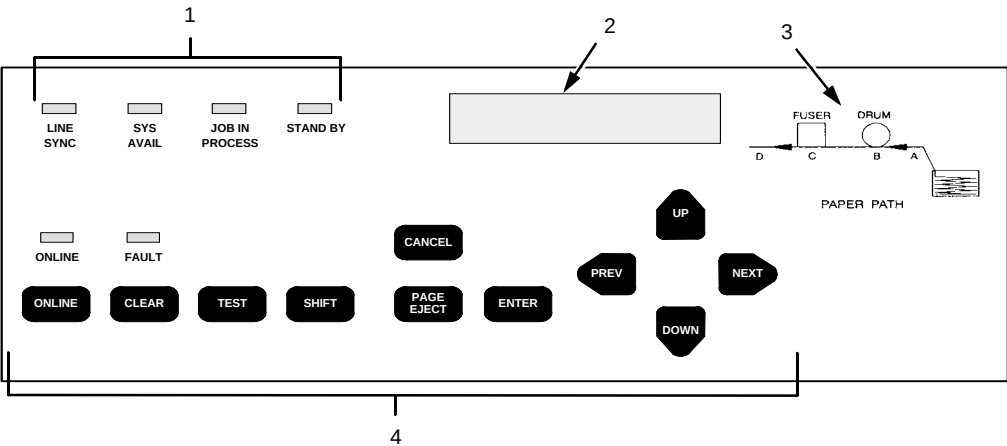
- a. The printer reprints only the pages affected by the fault.
- b. Press ONLINE to resume printing.

Error Messages

Table 4, “Error Messages,” on page 188, lists errors by error code and shows which are operator-correctable, which require field service, and which require reprinting.

- Operator-correctable errors include paper jams, and missing consumables.
- Errors requiring field service are printer failures that require the attention of service personnel.
- Errors requiring reprinting are those errors which require reprinting to recover from an error condition.

NOTE: The letter designations (A-D) following the “PAPER JAM” error messages in Table 4 match the sensor positions indicated on the control panel, as shown in the following illustration.



Legend:

- 1) Status Indicators
- 2) Liquid Crystal Display (LCD)
- 3) Sensor Positions A - D
- 4) Function Keys

Chapter 6 System Status And Error Messages

Table 4. Error Messages

Error Code	Error Message	Operator Correctable	Field Service Required	Reprint Required
01	Front Cover Open	✓		
02	Paper Empty	✓		
03	Paper Jam at Fuser (C)	✓		✓
04	Paper Jam at Exit (D)	✓		✓
05	Paper Jam at Exit (D)	✓		✓
06	No Transfer Unit	✓		
07	Scuff Lever Open (Knob "C")	✓		
08	Reserved			
09	Reserved			
0A	Cutter Fail		✓	
0B	Cutter Fail		✓	
0C	Transfer Platform Fail		✓	
0D	Transfer Platform Fail		✓	
0E	Reserved			
0F	Reserved			
10	Reserved			
11	Paper Jam at Drum (B)	✓		✓
12	Paper Jam at Fuser (C)	✓		✓
13	Paper Jam at Exit (D)	✓		✓
16	Paper Jam at Entrance (A)	✓		✓
17	High Voltage Failure		✓	
18	Drum Motor Fail		✓	
19	Surface Voltage too High		✓	
1A	Surface Voltage too Low		✓	
1D	Surface Voltage Fail		✓	
1E	Fuser Supply Fail		✓	
1F	Fuser Failure		✓	

Error Messages

Error Code	Error Message	Operator Correctable	Field Service Required	Reprint Required
20	Fuser Lamp Overheat		✓	
21	Fuser Fan Fail		✓	
22	Reserved			
26	No Cleaning Unit	✓		
27	Reserved			
28	Waste Toner Full	✓		
29	No Waste Toner Box	✓		
2A	Toner Low			
2B	Toner Density too High		✓	
2C	Toner Density too Low		✓	
2D	Toner Empty	✓		
2E	Reserved			
32	LED Head Overheat		✓	
36	Reserved			
37	Reserved			
38	Engine CPU Fail		✓	
39	Engine CPU Fail		✓	
3A	Engine CPU Fail		✓	
3B	Engine CPU Fail		✓	
3C	Engine CPU Fail		✓	
3D	Engine CPU Fail		✓	
3E	Engine CPU Fail		✓	
3F	Engine CPU Fail		✓	
40	Engine CPU Fail		✓	
41	Engine CPU Fail		✓	
42	Engine CPU Fail		✓	
43	Engine CPU Fail		✓	
44	Engine CPU Fail		✓	

Chapter 6 System Status And Error Messages

Error Code	Error Message	Operator Correctable	Field Service Required	Reprint Required
45	Engine CPU Fail		✓	
46	Engine CPU Fail		✓	
47	Engine CPU Fail		✓	
48	Controller Comm. Fail		✓	
49	Controller Comm. Fail		✓	
4A	Controller Comm. Fail		✓	
4B	Controller Comm. Fail		✓	
4C	Controller Comm. Fail		✓	
4D	Controller Comm. Fail		✓	
4E	Reserved		✓	
50	Stacker Fail		✓	
51	Stacker Fail		✓	
52	Stacker Fail		✓	
53	Stacker Fail		✓	
54	Stacker Fail		✓	✓
55	Stacker Busy	✓		✓
56	Stacker Fail		✓	
57	Stacker Cover Open	✓		
58	Stacker Jam at Paper Sensor	✓		✓
59	Stacker Jam at Roller Sensor	✓		✓
5A	Stacker Jam Clear Paper	✓		✓
5B	Stacker Fail		✓	
5C	Stacker Fail		✓	
5D	Stacker Fail		✓	
5E	Stacker Fail		✓	
5F	Stacker Fail		✓	
K0	DC Not 1st File	✓		

Error Messages

Error Code	Error Message	Operator Correctable	Field Service Required	Reprint Required
K1	File Not Compatible	✓		
K2	Wrong File Checksum	✓		
K3	DC Program Not Valid	✓		
K4	No Flash File System	✓		
K5	DRAM Fail at Address XXXXXXXX		✓	
K6	Flash Memory Fail		✓	
K7	Program Flash Fail at XXXXXXXX		✓	
K8	Flash Memory Full	✓		
K9	Program Needs More DRAM	✓		
L0	Invalid DRAM*/ Configuration		✓	

TABLE NOTES:

1. For *any* error with Reprint on Fault enabled: If the printer stops while in the middle of printing a page, reloading the paper and reprinting are required. There may be other cases requiring reloading and reprinting; if so, a message appears.
2. For *any* error with Reprint on Fault disabled: If the printer stops while in the middle of printing a page, reloading the paper is required and pages are lost.
3. For error numbers 01, 14, and 15: If the error occurs while paper is *not* moving, it is not necessary to reload or reprint.
4. For error number 02: If the error is caused by a paper-empty at the lower sensor (Paper Near End Sensor), it is not necessary to reprint.
5. Status message only. No operator action required to clear message.

Chapter 6 System Status And Error Messages

6. The Front Cover Open error can occur if the upper doors are open or the paper output door is open. If the upper doors are closed, push the paper output door in to release it to its down position.

A

Maintenance Log Sheets

Maintenance Log Sheets

The log sheets on the following pages are intended for your use. These may be photocopied and kept in a binder near the printer. Be sure to use them each time either you or your service provider perform printer maintenance.

Appendix A Maintenance Log Sheets

Level A Maintenance - 15,000 Pages (User)

Action	Item	Part #	Performed By	Date
Clean	General cleaning	N/A		
Clean	Main charger	705741-001		
Clean	Precharger	705742-001		
Clean	Transfer charger	705743-001		
Clean See Note 1	Cover glass	N/A		
Replace See Note 2	Toner cartridge	703532-050		
Note 1: Every 15,000 pages or 6 paper jams, whichever occurs first. Note 2: The Toner cartridge should be replaced about every 21,000 pages or as needed (for page coverage of 4%).				

Level B Maintenance - 150,000 Pages (User)

Level B Maintenance - 150,000 Pages (User)

Action	Item	Part #	Performed By	Date
Clean	General cleaning	N/A		
Clean	Main charger	705741-001		
Clean	Precharger	705742-001		
Clean	Transfer charger	705743-001		
Clean See Note 1	Cover glass	N/A		
Clean	SELFOC lens	N/A		
Vacuum	Lamp housing filter	202985-001		
Vacuum	Cleaning unit	705740-001		
See Note 2	Photoreceptor drum	703535-001		
Replace See Note 3	Toner cartridge	703532-001		
Replace	Developer	703548-001		
Replace See Note 4	Waste toner bottle	202984-001		
Note 1: Every 15,000 pages or 6 paper jams, whichever occurs first. Note 2: Inspect every 150,000 pages; clean if needed. Replace at 300,000 pages or sooner if print quality is no longer acceptable. Drum life is dependent upon media being used and proper maintenance and operation of the printer. Print media other than bond paper (e.g., labels, card stock, plastic, or vinyl) may reduce drum life as much as 50%. Note 3: The Toner cartridge should be replaced about every 21,000 pages or as needed (for page coverage of 4%). Note 4: The waste toner bottle is replaced every 90,000 pages, so may not need to be replaced at this time.				

Appendix A Maintenance Log Sheets

Level C Maintenance - 600,000 Pages (User)

Action	Item	Part #	Performed By	Date
Clean	General cleaning	N/A		
Clean See Note 1	Cover glass	N/A		
Clean	SELFOC lens	N/A		
Clean	Flash power supply filter	N/A		
See Note 2	Photoreceptor drum	703535-001		
Replace	Developing Unit	705739-001		
Replace See Note 3	Toner cartridge	703532-001		
Replace	Waste toner bottle	202984-001		
Note 1: Every 15,000 pages or 6 paper jams, whichever occurs first. Note 2: Inspect every 150,000 pages; clean if needed. Replace at 300,000 pages or sooner if print quality is no longer acceptable. Drum life is dependent upon media being used and proper maintenance and operation of the printer. Print media other than bond paper (e.g., labels, card stock, plastic, or vinyl) may reduce drum life as much as 50%. Note 3: The Toner cartridge should be replaced about every 21,000 pages or as needed (for page coverage of 4%).				

Level D Maintenance - 300,000 Pages (Service)

Level D Maintenance - 300,000 Pages (Service)

Action	Item	Part #	Performed By	Date
Clean	Flash power supply filter	n/a		
Replace	Main charger	705741-001		
Replace	Smoke filter	703540-001		
Replace	Precharger	705742-001		
Replace	Transfer charger	705743-001		
Replace	Lamp housing filter	202985-001		

Appendix A Maintenance Log Sheets

Level E Maintenance - 600,000 Pages (Service)

Action	Item	Part #	Performed By	Date
Replace	Main charger	705741-001		
Replace See Note 1	Cleaning unit	705740-001		
Replace	Smoke filter	703540-001		
Replace	Transporting belt-3	703531-035		
Note 1: When the cleaning unit has been vacuumed every 150,000 pages and has been used under nominal operating conditions, it must be replaced at 600,000 pages. However, it may need to be replaced more frequently if used for high-density printing or printing on uneven media, or if used under severe operating conditions.				

Level F Maintenance - 900,000 Pages (Service)

Level F Maintenance - 900,000 Pages (Service)

Action	Item	Part #	Performed By	Date
Clean	Flash power supply filter	n/a		
Replace	Main charger	705741-001		
Replace	Smoke filter	703540-001		
Replace	Xenon lamp	703541-001		

Appendix A Maintenance Log Sheets

Level G Maintenance - 1,200,000 Pages (Service)

Action	Item	Part #	Performed By	Date
Clean	Lamp housing filter	202985-001		
Clean	Flash power supply filter	n/a		
Replace	Main charger	705741-001		
Replace	Precharger	705742-001		
Replace	Transfer charger	705743-001		
Replace See Note 1	Cleaning unit	705740-001		
Replace	Smoke filter	703540-001		
Replace	Transporting belt-3	703531-035		
Replace	Developer Motor Unit	202995-001		
Note 1: When the cleaning unit has been vacuumed every 150,000 pages and has been used under nominal operating conditions, it must be replaced at 600,000 pages. However, it may need to be replaced more frequently if used for high-density printing or printing on uneven media, or if used under severe operating conditions.				

Level H Maintenance - 2,400,000 Pages (Service)

**Level H Maintenance - 2,400,000 Pages
(Service)**

Action	Item	Part #	Performed By	Date
Clean	Flash power supply filter	n/a		
Replace	Main charger	705741-001		
Replace	Precharger	705742-001		
Replace	Transfer charger	705743-001		
Replace See Note 1	Cleaning unit	705740-001		
Replace	Smoke filter	703540-001		
Replace	Transporting belt-3	703531-035		
Replace	Lamp housing filter	202985-001		
Replace	Capacitor: See WARNING on following page. The flash fuser capacitors (P/N 703542-001) must be replaced at least every 2,400,000 pages. Failure to do so may endanger equipment and personnel.	703531-001		
Replace	LED for discharge lamp	703531-118		
Replace	EPS1, EPS3, and EPS4 Sensor Levers	703531-585 703531-588 703531-067		
Replace	Trigger coil unit for GP150L	703531-165		
Replace	Exit feed roller drive belt	203090-001		

Note 1: When the cleaning unit has been vacuumed every 150,000 pages and has been used under nominal operating conditions, it must be replaced at 600,000 pages. However, it may need to be replaced more frequently if used for high-density printing or printing on uneven media, or if used under severe operating conditions.

Appendix A Maintenance Log Sheets

WARNING The flash fuser capacitor (P/N 703531-561) must be replaced at least every 2,400,000 letter size pages. Failure to do so may endanger equipment and personnel.

WARNUNG

Der kondensator der Flash-Einbrennvorrichtung muß nach mindestens 2.400.000 Seiten im Format "Letter" ausgetauscht werden. Geschieht dies nicht, ist mit Personen- und Sachschäden zu rechnen.

AVISO

El condensador flash del fusor se debe sustituir como mínimo cada 2.400.000 páginas de tamaño carta. De lo contrario, pueden causarse daños a los equipos y al personal.

ATTENTION

Pour éviter tout risque de dégâts matériels et corporels, remplacez l'unité de flashage après l'impression de 2 400 000 pages de format lettre.

AVVERTENZA

Il condensatore dell'unità fusore deve essere sostituito almeno ogni 2.400.000 pagine in formato lettera. La mancata sostituzione può causare lesione al personale e danni all'apparecchiatura.

CAUTION Due to the high temperature of the flash fusing unit, keep the area under the fuser free of paper debris.

Level D Maintenance Kit - 300,000 Pages (Service)

**Level D Maintenance Kit - 300,000 Pages
(Service)**

Item	Part Number
Maintenance Kit, Level D, L5020	706802-001
• Main charger • Precharger • Transfer charger • Smoke filter	

Appendix A Maintenance Log Sheets

Level E Maintenance Kit - 600,000 Pages (Service)

Item	Part Number
Maintenance Kit, Level E, L5020	706806-001
• Main charger • Precharger • Transfer charger • Smoke filter • Cleaning unit • Transport belt (set of 3) • Cutter motor	

Level F Maintenance Kit - 900,000 Pages (Service)

**Level F Maintenance Kit - 900,000 Pages
(Service)**

Maintenance Kit, Level F, L5020	706812-001
• Main charger • Precharger • Transfer charger • Smoke filter • Xenon (flash) lamp	

Appendix A Maintenance Log Sheets

Level G Maintenance Kit - 1,200,000 Pages (Service)

Item	Part Number
Maintenance Kit, Level G, L5020	706818-001
• Main charger • Precharger • Transfer charger • Smoke filter • Cleaning unit • Transport belt (set of 3) • Cutter motor • Trigger coil unit • Developing motor unit • Exit feed roller belt	

Level H Maintenance Kit - 2,400,000 Pages (Service)

**Level H Maintenance Kit - 2,400,000 Pages
(Service)**

Item	Part Number
Maintenance Kit, Level H, L5020	706830-001
• Main charger • Precharger • Transfer charger • Smoke filter • Cleaning unit • Transport belt (set of 3) • Cutter motor • Trigger coil unit • Developing motor unit • Exit feed roller belt • Lamp housing filter • EPS3 • EPS4 • Capacitor • Discharge LEDs (PEL)	



Appendix A

Maintenance Log Sheets

B

Specifications

Specifications

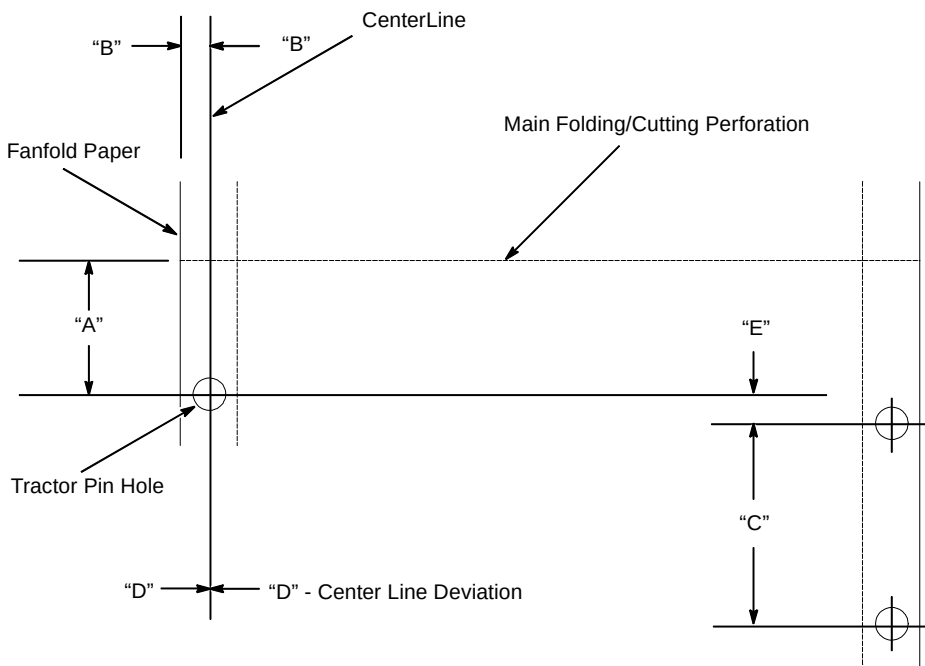
Paper Specifications

Paper type	Fanfold
Paper size	
Width	7 to 16 inches
Length*	1 to 30 inches, in multiples of 1/6 inch.
* Measured from main folding/cutting perforation to main folding/cutting perforation.	
Tractor pin holes	See the table and figure on the next page.

Appendix B Specifications

Specification	Inch	Millimeter	Dimension in Figure
Pin hole center to folding perforation	1/6, 1/4, 1/3, or 1/2	4.2, 6.4, 8.5, 12.7	A
Hole center line to edge of form	0.236 ±0.028	6.0 ±0.1	B
Hole diameter	0.156 ±0.004	4.0 ±0.1	N/A
Distance between centers of two consecutive holes	0.500 ±0.002	12.7 ±0.05	C
Max. deviation of holes from their center line	0.004	0.1	D
Max. deviation Left Hand hole to companion Right Hand hole (Center Line to Center Line)	0.006	0.15	E
Max. parallel deviation Left Hand hole Center Line to Right Hand hole Center Line	0.006	0.15	N/A

Paper Specifications



Paper thickness	.010 inch maximum
Paper weight	18-44 lb. bond (68-165g/m ²), 44-125 lb. tag/label (75-204g/m ²)
Capacity	3000 sheets (18 lb.)
Fanfold	Automatic paper parking mechanism incorporated
Stacker Perforation	
Cut	0.12 inches or 3mm minimum
Cut to Tie	3:1 minimum

Appendix B Specifications

Performance Characteristics

Printing density	300 x 300 dpi 400 x 400 dpi or 240 x 240 dpi (options)
Printing speed	2.78 inches per second.

Paper Size	Orientation	Printing Speeds (Pages per Minute)
A4	Landscape	20
Letter	Landscape	20
A4	Portrait	15
Letter	Portrait	15

Maximum effective print width	14.7 inches
Duty cycle	200,000 total pages/month of fanfold paper (11 inch length)
Mechanical life	5 years or 12,000,000 pages (11 inch length)
Warm-up time	60 sec. max.
First page printing time	25 sec. max.
MTBF/MPBF	8,000 hours/2,880,000 pages (letter size) 25% print to power on ratio
MTTR	2 hour max. (unit exchange)

Host Interfaces

Standard	Centronics parallel, Dataproducts parallel, serial RS-232/422
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NOTE: Dataproducts parallel interface requires an optional adapter cable.

Optional	IBM coax and twinax
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Emulations

Standard	LinePrinter Plus
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Optional	PCL5/LP+ PCL5/PGL PCL5/VGL IGP/VGL IGP/PGL IPDS
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Appendix B Specifications

Memory Requirements

The L5000 series printers have 32 MB (standard) or 64 MB (optional) of RAM (Random Access Memory), and 8 MB (standard) or 16, 32, or 64 (optional) of Flash Memory. This is available with all new printer shipments, and all upgraded printers.

Safety Regulations

UL	1950
CSA	950
EUROPE	EN 60950

Electromagnetic Interference

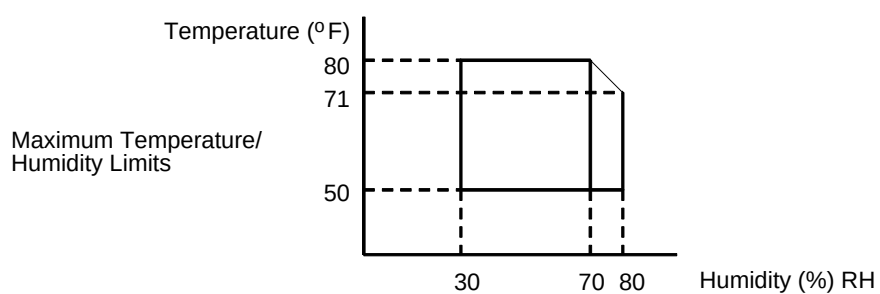
FCC	Class A
Europe	EN55022 Class A

Physical Characteristics And Environment

Physical Characteristics And Environment

Dimensions (H x W x D)	49 inch H x 30 inch W x 34 inch D In crate: 58 inches H x 36 inches W x 61 inches D
Weight	353 lbs. (or 441 lbs.) with options
Input voltage range	200 - 240 V $\pm 10\%$ 50/60 Hz (47 - 62 Hz) single phase
Power consumption	3300 W (operating); wall outlet <i>must</i> be on a 30-amp breaker.
Environment	
Temperature	Operating: 50° to 80° F (10° to 27° C) Non-operating: 14° to 95° F (-10° to 35° C)
Humidity	Operating: 30 to 80% RH Non-operating: 10 to 80% RH (non-condensing)

Appendix B Specifications



Sound level

Operating	60 db (A-weighted) max. Full options
Standby state	50 dB (A-weighted)
Inclination	1° max.

C

Host I/O Interfaces

Interfaces

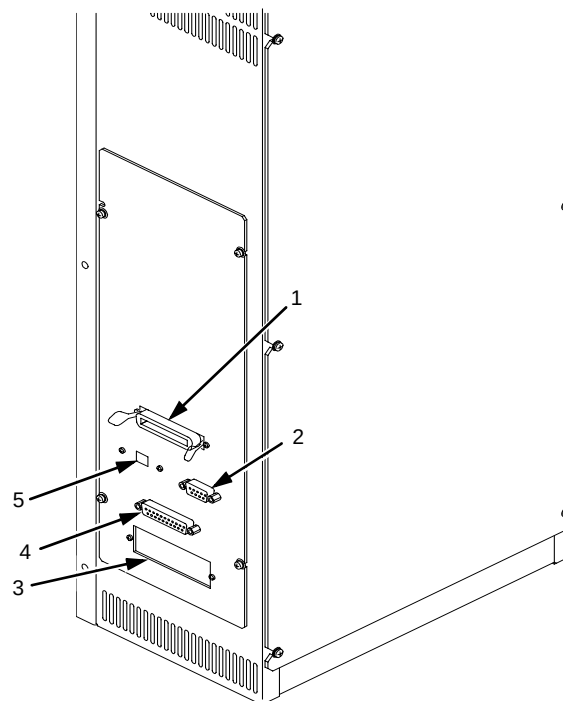
The printer provides connections inside the left side panel for the following host I/O interfaces:

- Serial Interface (RS-232 or RS-422)
- Centronics Parallel Interface
- Dataproducts Parallel Interface

The parameters for each interface are selected through the control panel via the “Host Interface” menu. (See page 65.)

The location of the interface connectors is shown in Figure 9.

You must supply the interface cable to connect the printer to your host computer. To facilitate the choice or manufacture of an interface cable for your application, pin assignments for the Serial, Centronics, and Dataproducts interfaces are provided in this appendix.



Legend:

- 1) Parallel Port
- 2) Diagnostic Port
- 3) Optional Coax/Twinax Port
- 4) Serial Port
- 5) RS 232/422 Switch

Figure 9: I/O Cable Connections

The RS 232/422 switch must be set properly for your application.
The factory default is RS 232.

Performance Considerations

The printer prints letter size and A4 size fanfold paper at 15 pages per minute portrait (one page every 4.0 seconds) and 20 pages per minute landscape. To sustain printing at full speed, data for each page must be received and rendered in less than 4.0 seconds for portrait mode (otherwise the printer pauses).

Failure to print at full speed may be caused by one or more of the following:

- an inefficient application program
- an insufficient communication interface bandwidth
- a slow host computer
- a low priority on the host printer port or printing task
- a highly complex print job, usually containing a large number of characters and graphics that exceeds the bandwidth of the controller

An inefficient application program is listed first because a highly efficient program sends fewer characters to the printer than a less effective program, and it can be used to overcome the other four causes of performance problems. This is especially true of IGP/VGL and IGP/PGL applications, due to the power of these printer emulations. In many cases, converting a program from IGP/VGL to IGP/PGL results in substantial performance improvements.

Wide width printing jobs with a large number of characters on a page can exceed the communication bandwidth and/or the communication speed of the host computer. A plain text print job of 132 columns by 66 lines requires a sustained data transmission rate of 3485 characters per second, or for serial communication a sustained throughput of 34.85 KBaud (assuming 8 bits of data, 1 stop bit, 1 start bit, and no parity bit). In this case, RS-232 would be an unacceptable selection for communication because the maximum RS-232 baud rate of 19.2 KBaud is less than the required 34.85 KBaud sustained throughput. Sustaining high communication data transfer rates may require the host computer to be tuned to meet the printer's speed requirements.

On mini or mainframe computers, printer performance problems can usually be solved by having the system administrator perform one or more of the following:

- assign a higher priority to the print spooler
- increase the size of the host's output buffer
- dedicate a communication controller to the printer

Solving system performance problems with IBM-compatible PC's varies depending upon the operating system (OS/2[®] Windows[®], or MSDOS[®]) and the speed and manufacturer of the PC.

Performance problems with networked printers are best left to the expertise of the network administrator, since each element between the printer and the host computer can affect performance.

There are cases where the desired printout is sufficiently complex to exceed the bandwidth of the controller. This is evident if the printer is exerting the communication flow control for extended periods of time followed by a printer pause. Assuming that the software application has already been tuned for efficiency, under these circumstances, do the following:

1. Check to see if the minimum amount of memory is installed (see Appendix B, "Specifications").
2. Try changing the font cache memory allocation based upon the size of characters being sent. See the "Maximum Cached Character" topic on page 87 for details.
3. Set the Image Width configuration menu parameter to the minimum width required for the print job.
4. Try to minimize the number of font changes per page.
5. Try to decrease the printing resolution (400 DPI to 300 DPI, or 300 DPI to 240 DPI).
6. Decrease the complexity and/or number of characters in the printed output.

For application efficiency in IGP/PGL or IGP/VGL, it is best to store a form in the printer and then execute it with dynamic data, rather than send the entire form each time.

RS-232 Serial Interface

Also if possible, eliminate sending white space (spaces or tabs) at the end of lines if it is not necessary.

Memory intensive applications may require an adjustment to the allocation of global memory for optimal performance. This may include applications where:

- the form length is greater than 24 inches
- a great number of forms or fonts are being used interchangeably
- the printing resolution is 400 dpi

Refer to the *L5020 Maintenance Manual* or contact a qualified service representative for details on adjusting the global memory.

RS-232 Serial Interface

This interface is used with bit serial devices compatible with EIA[®] RS-232E or CCITT V.24 standards. The interface circuit characteristics are compatible with the Electronic Industry Association Specification.

The printer is configured as Data Terminal Equipment (DTE).

The serial data transfer baud rate is selectable from the control panel. The input format consists of a single start bit, 7 or 8 data bits, and one or two stop bits. The operator can set the number of data bits from the control panel. The data bits are interpreted with the least significant bit first. The operator can also set parity checking via the control panel. The printer interface uses a first-in/first-out buffer with the size selectable from the control panel. The asynchronous interface accepts data as it is provided by the host computer.

The maximum cable length from the host computer to the printer is 50 feet.

The maximum baud rate supported by the RS-232 serial interface is 19.2 KB.

Printing at full-rated speed may require either an RS-422 or parallel connection for wide format printing applications.

RS-232 Serial Interface Connector Pin Assignments

The printer provides a 25-pin DB-25S connector inside the lower cabinet for connection of a serial interface cable. This connector is also used for the RS-422 serial interface. Selection of the desired interface is determined by the position of the RS-232/422 switch located inside the lower cabinet of the printer.

The following table lists the pin assignments of the RS-232 interface connector.

Pin	Signal	Direction
1	Chassis Ground	Not applicable
2	Transmit Data (TxD)	From printer
3	Receive Data (RxD)	To printer
4	Request To Send (RTS)	From printer
5	Clear To Send (CTS)	To printer
6	Data Set Ready (DSR)	To printer
7	Signal Ground	Not applicable
8	Carrier Detect (CD)	To printer
11, 14	Reverse Channel (RC)	From printer
20	Data Terminal Ready (DTR)	From printer

RS-232 Serial Interface Signals

The RS-232 serial interface signals are defined below.

Receive Data (RxD) - Serial data stream to the printer.

Transmit Data (TxD) - Serial data stream from the printer for transmitting status and control information to the host. Subject to protocol selection.

Request To Send (RTS) - Control signal from the printer. Subject to configuration.

Clear To Send (CTS) - Status signal to the printer indicating the host is ready to receive data/status signals from the printer. When CTS is enabled, DSR and CTS must both be asserted for the printer to transmit flow control characters to the host.

Data Set Ready (DSR) - Status signal to the printer indicating the host is in a ready condition. DSR is ignored unless CTS or CD are enabled.

Carrier Detect (CD) - Status signal to the printer. The ON condition is required for the printer to receive data. Available as a configuration setup option. When CD is enabled, the host must assert both DSR and CD for the printer to accept data.

Data Terminal Ready (DTR) - Control signal from the printer to the host. When enabled, the host activates the data channel. Subject to configuration.

RS-232 Serial Interface Configuration

The printer is configured for the RS-232 serial interface via the Serial Interface menu, as described on page 73. The following interface configuration parameters may be modified to meet specific application requirements:

Host Protocol	None
Baud Rate	9600
Data Bits (Word Length	8 Data Bits
Stop Bits	1 Bit
Parity	None
DTR Function	On/Offline&Buf
RTS Function	On/Offline&Buf
DTR Polarity	Normal
RTS Polarity	Normal
Buffer size	8192 Bytes
Number Buffers	2
FIFO Trigger	14 Bytes
Diagnostic	None
Series 1 Poll	0
Series 1 Delay	0+ Msec.
Series 1 Idle	Disable

RS-422 Serial Interface

This interface is used with bit serial devices compatible with EIA-RS-422B or CCITT V.27 and V.11 standards. The interface circuit characteristics are compatible with the Electronic Industry Association Specification.

The printer is configured as Data Terminal Equipment (DTE).

The serial data transfer baud rate is selectable from the control panel. The input format consists of a single start bit, 7 or 8 data bits, and one or two stop bits. The operator can set the number of data bits from the control panel. The data bits are interpreted with the least significant bit first. The operator can also set parity checking via the control panel. The printer interface uses a first-in/first-out buffer with the size selectable from the control panel. The asynchronous interface accepts data as it is provided by the host computer.

The maximum cable length from the host computer to the printer is 4000 feet.

The maximum baud rate supported by the RS-422 serial interface is 256 KB.

RS-422 Serial Interface Connector Pin Assignments

The printer provides a 25-pin DB-25S connector inside the lower cabinet for connection of a serial interface cable. This connector is also used for the RS-232 serial interface. Selection of the desired interface is determined by the position of the RS232/422 switch located inside the lower cabinet of the printer.

The following table lists the pin assignments of the RS-422 interface connector.

Pin	Signal	Direction
1	Chassis Ground	Not applicable
2	Transmit Data A (TxDA)	From printer
14	Transmit Data B (TxDB)	From printer
3	Receive Data A (RxDA)	To printer
16	Receive Data B (RxDB)	To printer
4	Request To Send A (RTSA)	From printer
19	Request To Send B (RTSB)	From printer
5	Clear To Send A (CTSA)	To printer
13	Clear To Send B (CTSB)	To printer
6	Data Set Ready (DSR) / Clock A	To printer
22	Clock B	To printer
7	Signal Ground	Not applicable
20	Data Terminal Ready A (DTRA)	From printer
23	Data Terminal Ready B (DTRB)	From printer

RS-422 Serial Interface Signals

The RS-422 serial interface signals are defined below.

Received Data (RxD) - Serial data stream from the host to the printer.

Transmitted Data (TxD) - Serial data stream from the printer to the host. Subject to protocol selection.

Request To Send (RTS) - Control signal from the printer to request permission to send data to the host. Subject to configuration.

Clear To Send (CTS) - Status signal to the printer indicating the host is ready to receive data/status signals from the printer. When CTS is enabled, DSR and CTS must both be asserted for the printer to transmit flow control characters to the host.

Data Set Ready (DSR) / Clock B - Status signal to the printer indicating the host is in a ready condition. DSR is ignored unless CTS is enabled.

Data Terminal Ready (DTR) - Control signal from the printer to the host. When enabled, the host activates the data channel. Subject to configuration.

Clock Signal B - External timing for signals on data channel B.

RS-422 Serial Interface Configuration

The printer is configured for the RS-422 serial interface via the Serial Interface menu, as described on page 73. The following interface configuration parameters may be modified to meet specific application requirements:

Host Protocol	None
Baud Rate	9600
Data Bits (Word Length	8 Data Bits
Stop Bits	1 Bit
Parity	None
DTR Function	On/Offline&Buf
RTS Function	On/Offline&Buf
DTR Polarity	Normal
RTS Polarity	Normal
Buffer size	8192 Bytes
Number Buffers	2
FIFO Trigger	14 Bytes
Diagnostic	None
Series 1 Poll	0
Series 1 Delay	0+ Msec.
Series 1 Idle	Disable

Centronics Parallel Interface

This interface enables the printer to operate with controllers designed for buffered Centronics printers. The interface is capable of transferring up to 200,000 characters per second. The maximum cable length from the controller (host computer) to the printer is 15 feet.

Centronics Parallel Interface Connector Pin Assignments

The printer provides a 36-pin D-shell connector inside the lower cabinet for connection of a Centronics parallel interface cable. The following table lists the pin assignments of the Centronics interface connector.

Input Signals		Output Signals	
Signal	Pin	Signal	Pin
DATA LINE 1	2	ACKNOWLEDGE	10
DATA LINE 2	3	SELECT	13
Return	21		
DATA LINE 3	4	PAPER EMPTY	12
Return	22	Return	30
DATA LINE 4	5	BUSY	11
Return	23	Return	29
DATA LINE 5	6	PRIME	31
Return	24		
DATA LINE 6	7	NFAULT	32
Return	25		
DATA LINE 7	8		
Return	26		
DATA LINE 8	9	Reserved	36
Return	27		
PAPER INST	15	Chassis GND	17
Return	14		
DATA STROBE	1	Spares	33, 34,
Return	19		35

Centronics Parallel Interface Signals

The Centronics interface signals are defined below.

PAPER EMPTY (PE) - A high true level from the printer to indicate the printer is in a fault condition.

SELECT - A high true level from the printer to indicate the printer is ready for data transfer and the ONLINE key has been activated.

BUSY - A high true level from the printer to indicate the printer cannot receive data.

ACKNOWLEDGE - A low true pulse from the printer indicating the character or function code has been received and the printer is ready for the next data transfer.

DATA STROBE - A low true, 100 ns minimum pulse from the host to clock data into the printer.

DATA LINES - Eight standard or inverted levels from the host that define the data, which may consist of a character or function code. Sensing Data Line 8 is controlled by printer configuration.

PAPER INST - Optional VFU control signal from the host with the same timing and polarity as the data lines. Sensing of the PAPER INST line (PI line) is controlled by printer configuration.

PRIME - Optional low true signal from the host used to reset the printer to its default power-up state.

NFAULT - A low true level from the printer to indicate the printer is in a fault condition.

NOTE: The PAPER INST line must be disabled (configuration option selected from the control panel) if the host computer does not drive or control it. If the line is not controlled by the host and PAPER INST line sensing is enabled in the printer, rapid paper slewing occurs.

Centronics Parallel Interface Configuration

The printer is configured for the Centronics interface via the Centronics Interface menu, as described on page 66. The following interface configuration parameters may be modified to meet specific application requirements:

Data Bit 8	Enable* or Disable
Paper Inst Line	Enable or Disable*
Data Polarity	Standard* or Inverted
Strobe Polarity	Standard* or Inverted
ACK Polarity	Standard* or Inverted
Busy Polarity	Standard* or Inverted
Slct (Select) Polarity	Standard* or Inverted
Fault Polarity	Standard* or Inverted
Paper Instr Pol	Standard* or Inverted
PE Polarity	Standard* or Inverted
NFAULT/PE Clt	Act Together* or Act Separate

* = Factory default setting

Dataproducts Parallel Interface

This interface allows the printer to operate with controllers designed for Dataproducts printers. The interface is capable of transferring up to 500,000 characters per second. The maximum cable length from the controller (host computer) to the printer is 40 feet.

Dataproducts Parallel Interface Connector Pin Assignments

The printer provides a 36-pin D-shell connector inside the lower cabinet for connection of a parallel interface cable. This 36-pin connector requires a cable adapter to convert it to a 50-pin AMP connector for Dataproducts compatibility. Contact the factory for the adapter (p/n 703316-001). The following table lists the pin assignments of the Dataproducts cable adapter.

Input Signals		Output Signals	
Signal	Pin	Signal	Pin
DATA LINE 1	19	READY	22
		Return	6
DATA LINE 2	19	ON LINE	21
Return	3	Return	5
DATA LINE 3	1	DATA REQUEST	23
Return	2	Return	7
DATA LINE 4	41	Return	39
Return	40		
DATA LINE 5	34	Interface Verif.	45, 46
Return	18		
DATA LINE 6	43	PAPER INST	30
Return	42	Return	14
DATA LINE 7	36		
Return	35		
DATA LINE 8	28		
Return	44		
DATA STROBE	15		
	14		
DATA STROBE	38		
Return	37		

Dataproducts Parallel Interface Signals

The Dataproducts interface signals are defined below.

READY - A high true signal from the printer indicating AC power and DC voltages are present, paper is loaded properly, and the printer is not in a fault condition.

ON LINE - A high true signal from the printer indicating the Ready Line is true and the ONLINE key on the control panel has been activated. The printer is ready to accept data from the host.

DATA REQUEST - A high true signal from the printer to synchronize host data transmission with printer timing. This signal goes true when the printer is ready to receive data. It changes to the false state shortly after the leading edge of the data strobe signal.

DATA STROBE - A high true pulse from the host to indicate that data is ready. The data strobe must remain high at least until the Data Request line goes false.

DATA LINES - Eight standard or inverted levels from the host that specify character data, plot data, or a control code. Sensing Data Line 8 is controlled by printer configuration.

PAPER INST - Optional standard or inverted level VFU control signal from the host with the same timing and polarity as the data lines. Sensing of the PAPER INST line (PI line) is controlled by printer configuration.

NOTE: The PAPER INST line must be disabled (configuration option selected from the control panel) if the host computer does not drive or control it. If the line is not controlled by the host and PAPER INST line sensing is enabled in the printer, rapid paper slewing occurs.

Interface Verification - Two pins on the interface connector jumpered together allow you to verify proper installation of the interface connector.

Dataproducts Parallel Interface Configuration

The printer is configured for the Dataproducts interface via the Dataproducts Interface menu, as described on page 70. The following interface configuration parameters may be modified to meet specific application requirements:

Data Bit 8	Enable* or Disable
Paper Inst Line	Enable or Disable*
Data Polarity	Standard* or Inverted
Strobe Polarity	Standard* or Inverted
Data Req Pol	Standard* or Inverted
Ready Polarity	Standard* or Inverted
Online Polarity	Standard* or Inverted
Paper Instr Pol	Standard* or Inverted

* = Factory default setting

Termination Resistors

For parallel interface configurations, the printer is equipped with 470 ohm pullup and 1K pulldown terminating resistors located on the printer motherboard.

Generally, these terminating resistors are suitable for most applications. If, however, the standard terminating resistor pack is not compatible with the particular interface driver requirements of your host computer, other values or combinations of pullup/pulldown resistors may be necessary. For example, the Dataproducts interface and some host computers require the use of 220 ohm pullup and 330 ohm pulldown resistors.

If you are experiencing communication problems between the printer and host (double or missing characters), the cause may be the value of the termination resistors on the motherboard. Contact your authorized service representative for instructions on replacing the termination resistors.



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